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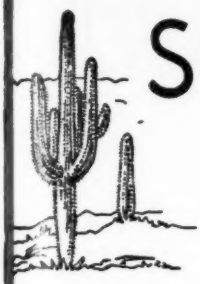

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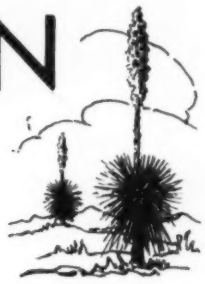

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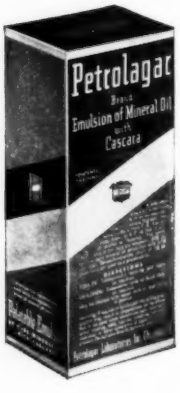

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Vol. XXV EL PASO, TEXAS, SEPTEMBER, 1941 No. 9

Treatment of Nerve Injuries of the Upper Extremities*

RALPH M. STUCK, M. D.
Denver

INTRODUCTION

THE proper treatment of peripheral nerve injuries requires both an adequate understanding of the anatomy of the nerves under consideration and a knowledge of the physiological and pathological reactions of peripheral nerves. Adequate treatment cannot be instituted in an individual case until the nerve lesion has been identified and the pathological process determined.

In cases in which the location of the lesion can be identified by skin laceration or fracture, repair can be made at once. However, if a large area is contused, if the case is old, or if there is no external evidence of injury, painstaking care is needed to establish a diagnosis.

DIAGNOSIS

The nerve supply of the upper extremities includes[1] (Fig. 1) (1) the nerves to the trapezius, (2) the nerves to the scapular muscles, (3) the anterior thoracic, (4) the axillary, (5) the musculocutaneous, (6) the median, (7) the radial, (8) the ulnar nerves, and other direct branches.

The nerves to the trapezius muscle are both the spinal accessory and cervical nerves. Their function can be tested by forcibly elevating or shrugging the shoulder.

(2) Direct nerve branches from the brachial plexus supply the scapular muscles. The function of the nerves supplying these muscles may be tested by rotating the scapula and externally rotating the arm.

(3) Two anterior thoracic nerves innervate the pectoral muscles. Their function is tested by having the patient extend his arms forward and then forcibly pressing his hands together.

(4) The axillary nerve supplies the deltoid and teres minor muscles. Its function can be determined by abduction of the arm, and its sensory segment by examining sensation in the skin area overlying the lower part of the deltoid muscle.

(5) The musculocutaneous nerve supplies the biceps and the brachialis muscles and the skin on the radial border of the forearm. Its function can therefore be examined by flexing the forearm at the elbow and by testing sensation in the area mentioned.

(6) The median nerve supplies the pronators of the forearm, the flexors of the wrist and fingers, and the short abductor of the thumb. When it is injured, the typical case presents the apelike hand with an inability to make a fist and to oppose the thumb to the little finger. The sensory distribution of the median nerve is variable. In most cases of isolated median nerve lesions, a loss of sensation will be found on the radial side of the palm, on the palmar surface of the thumb, index, and middle fingers, and on the dorsal surface of the last two phalanges of the index and middle finger.

(7) The radial nerve supplies the extensors of the forearm, the short supinator, the brachioradialis, the extensors of the wrist and fingers, and the abductors of the thumb. The sensory distribution of this nerve is to the radial side of the dorsum of the hand and the forearm.

In the study of the loss of function of the radial nerve, the level of injury is most important. A lesion of this nerve high up in the upper arm may completely or partially paralyze the triceps muscle, but may produce no sensory change because of the extensive sensory nerve

*Presented at the fifty-ninth annual meeting of the New Mexico Medical Society at Raton, New Mexico, May 27, 1941.

overlap. Lesions at the elbow produce extensor paralysis with wrist drop while lesions below the elbow produce weakness of the extensors of the wrist and some sensory disturbance on the back of the hand.

(8) The ulnar nerve supplies the flexors of the wrist, the adductors of the thumb, the interosse (which oppose and separate the fingers), the lumbricales muscles of the third and fourth fingers (which flex the first and extend the

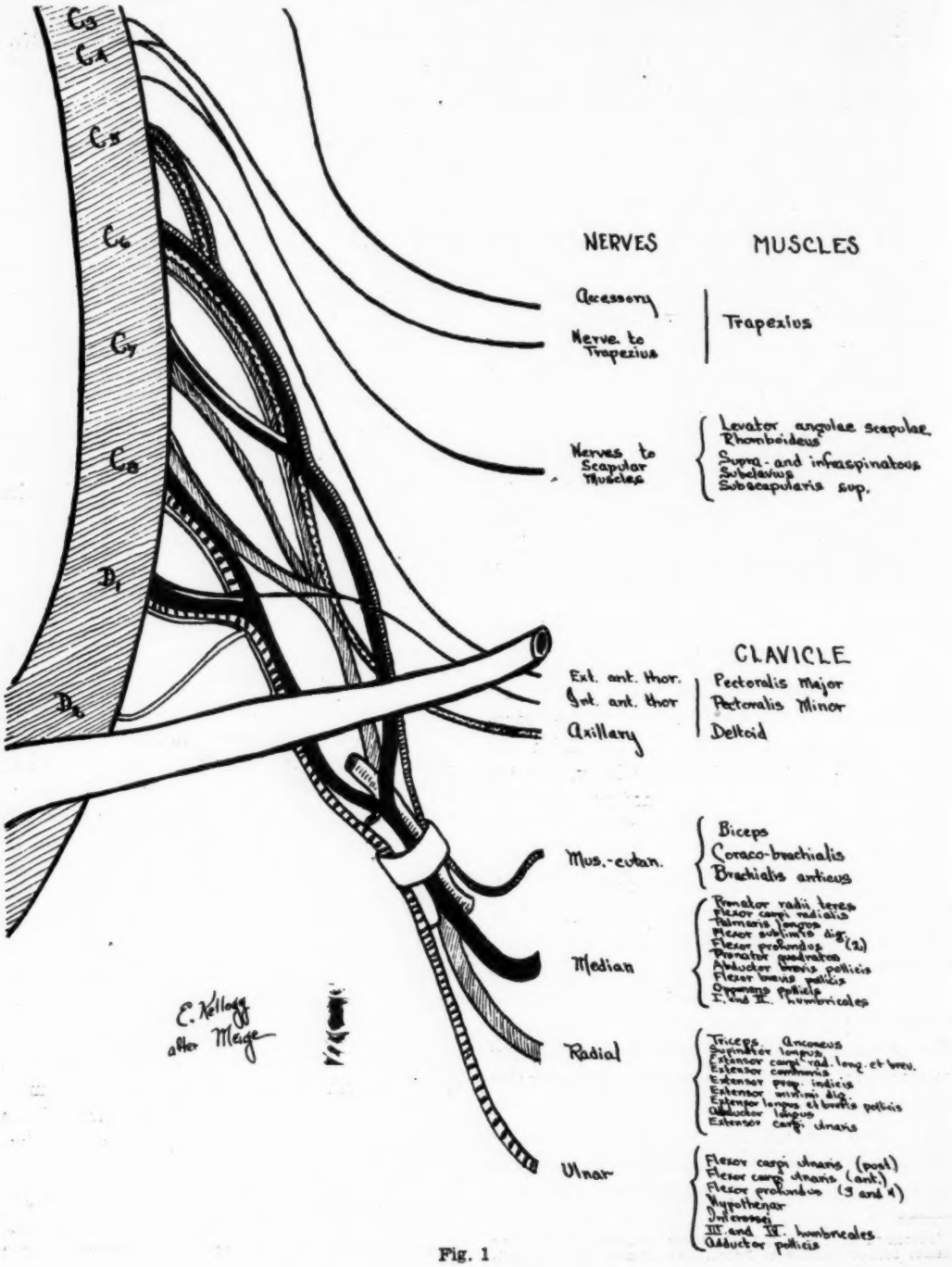

Fig. 1

second and third phalanges), and the skin of the little finger and the ulnar border of the ring finger and hand. Complete destruction of this nerve produces the typical claw hand with atrophy of the intrinsic muscles demonstrated by an inability to oppose or to separate the fingers and by difficulty in opposing the thumb. The sensory loss is on the ulnar border of the hand and ring finger, and on the whole of the little finger.

HISTORY

In the history of a nerve injury, answers to these questions are important: (1) Where was the original wound and what was its nature? (2) Was the skin broken? (3) What kind of object produced the injury? (4) What sensation did the patient experience with the injury? (5) Was there an immediate paralysis? If not, how long did it take to develop? (6) How old is the injury? (7) Was an attempt made to repair the nerve?

EXAMINATION

While the facts obtained in the history are vital, it is also important to examine (1) the type and location of a fracture, (2) the development of a bony callus, (3) the gross deformity of an extremity, (4) the mobility of the parts and the pain on motion, (5) the atrophy of muscle groups, (6) the rate and degree of functional return, and (7) the character of the skin.

INCOMPLETE SENSORY LOSS

Loss of sensation from injury to a sensory or a combined sensory and motor nerve does not always appear to follow accurately the anatomical distribution of that nerve. Two important facts may explain this phenomenon. In the first place, only the fibers interrupted will show the loss of function when a nerve is partially severed. In the second place, nerve overlap, that is, the multiple nerve supply to a single part of the body may confuse the sensory pattern. Peripheral nerves anastomose and overlap in their skin distribution, and the area of sensory loss may be smaller than the area anatomically supplied by the nerve injured.

SWEATING

As sweating is a function of cutaneous peripheral nerves, there is, with their interruption, a loss of sweating in an area similar to the sensory loss. A test performed by painting the patient's hand with iodine and starch and causing it to sweat by applying heat is valuable in demonstrating loss of sympathetic fiber function and in differentiating organic from hysterical sensory loss.

CAUSALGIA

Causalgia, which occasionally follows nerve injury and repair, is an excruciating paroxysmal pain in an extremity. This pain may be brought on by jarring or by exposure of the part to air or dry heat. It usually develops in several months, and may disappear at any time over a period of two years. The nerves most frequently involved are the median and the sciatic.

A patient affected with this condition protects the extremity with warm moist packs or fleece lined gloves, and may avoid contacts with people to the extent of becoming "shut-in."

TREATMENT

The indications for surgical exploration and repair of an injured nerve are not uniform for all cases. If anatomical interruption, that is, complete or partial severing of the nerve, can be proved, then the nerve repair should be done at once. However, if anatomical interruption cannot be proved, much study may be necessary, especially when the skin has not been broken, to determine what treatment should be given. Davis [1, 2] believes that in the presence of a complete functional interruption, a total anatomical severance does not exist if there is subsequently evidence of return of function. Evidence of complete interruption of nerve fibers indicating need of immediate surgical repair is found in complete paralysis of all muscles supplied by the nerve below the level of the lesion, in loss of normal electrical reactions in the muscles, in extensive and rapid muscle atrophy, and in loss of sensation in the area of isolated supply of the nerve injured.

Where there is question of complete or incomplete anatomical interruption of a nerve, it is wise to wait for four to six months for evidence of return of function before exploring and repairing the nerve.

The character of the original wound and the type of object that caused the damage assist in determining the time for repair and the method.

If the skin is not broken, it is advisable to observe the patient for a while before any surgical procedure is recommended. However, if there is marked contusion and questionable laceration, it may be necessary to explore the nerve at once.

A lacerated wound should always be scrubbed with soap and water and then debrided before the nerves and other structures are repaired. The nerve ends should be sought out by dissection and electrical stimulation and then approximated, care being taken not to suture them to other structures such as tendons. Infection may complicate healing and delay the nerve repair. However, even in the presence of infection, it is better to have the nerve ends joined in order to simplify the repair at a later date.

In healed wounds that have been infected, two weeks to a month should be allowed for all evidence of previous infection to be eliminated. An excellent test for the presence of a latent infection is to keep the wound in hot wet packs for 48 hours with occasional massage. Most infections will show up in this interval. If possible, nerve splicing should be avoided in an infected area.

In the actual nerve repair, most satisfactory results are obtained by accurate end-to-end anastomosis without rotation of the nerve. The nerve trunk is marked with small sutures to avoid rotation, the wound is made bloodless, the cleanly cut nerve ends are approximated, and the sheaths sutured together.

In dealing with a nerve scar with or without neuroma formation, wide exposure of the nerve is essential. It is never wise to begin dissection of a nerve scar until the normal nerve has been identified above and below the lesion. Before attempting to repair the nerve, the surgeon should free it through the scar in one continuous piece, and then should remove the fibrous tissue scar.

The nerve scar or neuroma must be removed before adequate repair can be made. To accomplish this, careful scrutiny of the nerve fibers is essential. If enough length can be made up in the nerve by flexion or extension of an extremity, or by transposing or gently stretching the nerve, transverse cuts should be made through the nerve scar with a razor blade until the normal nerve bundles are seen. The margin of the scar can be identified by injecting saline into the nerve above and below it as the distension will stop abruptly at the scar.

Nerve tissue is elastic and can be gently stretched to overcome small defects. Larger defects, however, can be repaired (1) by freeing the nerve trunk for a distance, (2) by flexing or extending an extremity, (3) by transpositioning a nerve, or (4) by secondarily resuturing the nerve.

Freeing the nerve trunk for a considerable distance above and below the lesion with dissection and liberation of large superficial branches will in many instances make up for large defects in nerve length.

Nerves which pass around a joint usually are tensed in one position of the joint and relaxed in another. In the relaxed position, the nerve may be in such a state that several centimeters of nerve tissue can be removed and the ends still approximated. After the repair of the nerve, the joint is kept in this optimum position for six weeks or more and is gradually returned to its normal position and function during another six weeks.

The course of a nerve may frequently be shortened by raising it to a more superficial position, by deepening its position, or, as with the ulnar nerve, by changing its course entirely.

By secondary resuture of the nerve is meant suturing the scarred ends of the nerve together after removing the maximum amount of nerve scar possible, returning the extremity gradually to its normal position, reopening the wound, and making up the remaining nerve length necessary to approximate freshly sectioned nerve ends for the final repair. This method usually takes longer than initial nerve graft, but it is much more satisfactory on the whole.

NERVE SUTURE

Nerve suture [8] should never be attempted if undue tension is necessary to approximate the nerve ends. All bleeding must be controlled and fresh smoothly cut nerve ends joined. (Fig. #2) For nerve suture, I use fine artery needles with split waxed #A black silk. Two stay sutures are placed opposite each other high up on the sheath of the nerve; fine inter-

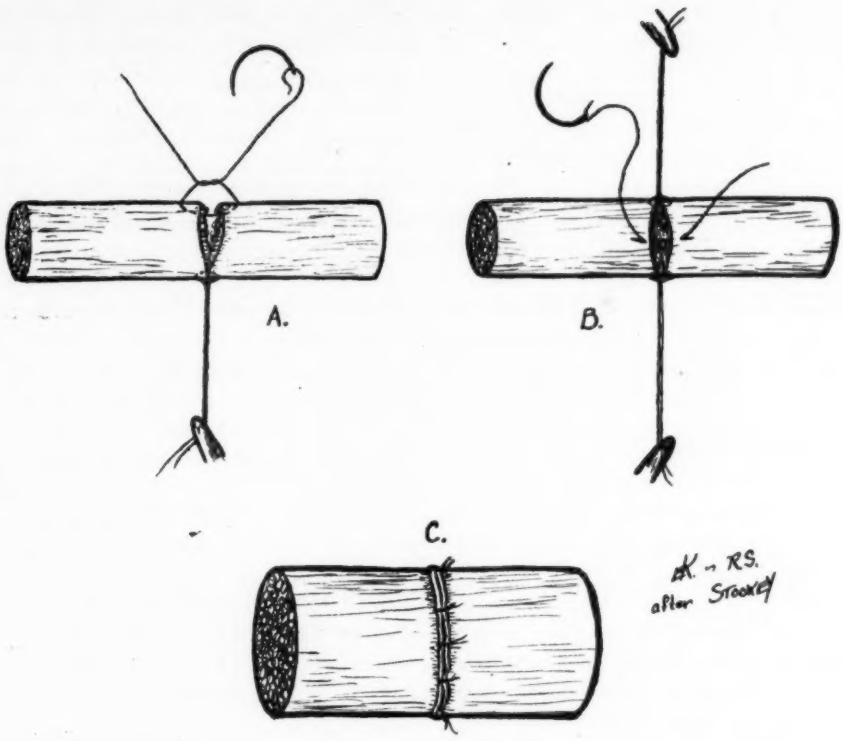

Fig. 2

rupted sutures are then placed in the sheath to approximate the ends. The sutured nerve is then laid in a bed of fat or muscle tissue and the wound closed.

POST OPERATIVE CARE

Following most nerve repairs, the extremity should be fixed in plaster for about six weeks with gradual return of function over another period of six weeks. The plaster half-shell or crinolin cast is usually sufficient to fix the extremity.

After the surgical repair of a peripheral nerve, care should be taken to keep the affected muscles in good tone and to continue proper functioning of the joints. As the nerve growth reaches the affected muscles, function returns much more satisfactorily with such care. If muscles contracture or periaticular fibrosis is allowed to develop, it is often impossible to get a good final functioning result even with a normally functioning nerve.

Adequate physiotherapy in the form of active massage and of active and passive movements of the affected extremity will keep muscles and joints in good condition for eventual return of nerve function; it, of course, must be diligent to obtain good functional results.

FALSE SIGNS

Occasionally when there has been only a contusion without actual laceration of a nerve, false signs of improvement may be seen. In such cases, it is natural to conclude that an abnormally rapid nerve growth has taken place. Contused and edematous nerves recover without Wallerian degeneration and with only temporary functional loss. It must be remembered that if a nerve is actually severed, its growth begins on about the fourteenth day and continues at the rate of one to two millimeters daily.

False signs of sensory improvement are seen as a result of nerve overlap, and false signs of muscle recovery are seen in the supplementary function of other unparalyzed muscles.

IRREPARABLE NERVE LESIONS

In a few instances, nerve injury is so extensive that repair cannot be considered. Such cases are truly orthopedic problems requiring

muscle transplants and joint arthrodeses for satisfactory functional results.

SUMMARY

The results of proper nerve repair of most peripheral nerve injuries are exceedingly good. An almost normally functioning extremity is frequently seen in injuries that are well repaired. In questionable cases, it is better to attempt nerve repair than to abandon all hope of functional nerve recovery.

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The Relationship of Surgical Immobilization of Both Osseous and Pulmonary Tuberculosis

FRED H. ALBEE, M. D.
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OVER thirty-five years of experience with tuberculosis has convinced me that the advantages from good surgery are as great in bone and joint tuberculosis as in pulmonary tuberculosis and vice versa,—and the rationale the same.

Why surgical methods to immobilize tuberculous tissue in the lung were so much slower in being generally adopted by the profession than in the instance of the osseous system, it is difficult to explain; although it can be said that, as a research problem, the osseous system is much more favorable for the production of complete immobilization and easier to draw trustworthy conclusions from clinical observations as well as from laboratory findings. In a large number of cases, during the past thirty-five years, I have painfully observed a brilliant result obtained by a surgically induced fusion in a very advanced tuberculosis of a joint or joints come to naught because of the failure to control in the same patient an incipient pulmonary lesion.

Dr. J. Crocket, [1] University of Glasgow, M. J. 1935, states: "Artificial pneumothorax, as a means of producing local rest, was first suggested in 1822 by Dr. Carson of Liverpool. It took, however, a hundred years for Carson's assertion to become a fact in the experience of the profession, and it has taken fully another decade for its real value to be recognized. (1932)

In a paper which I read at the opening of the 38th French Congress of Surgeons, Paris, France, 1929, [2] in relation to osseous tuberculosis, I stated: "It is axiomatic that an advanced destructive tuberculous process in a joint can never be said to be cured except when bony ankylosis has occurred; in the absence of this ankylosis, there is never any certainty that relapses will not occur. This axiom is more applicable to tuberculosis of the spine than to articular tuberculosis elsewhere."

SPINAL AND PULMONARY TUBERCULOSIS

The therapeutic problems of spinal tuberculosis and pulmonary tuberculosis have more in common than is the case with any other part of the osseous system. The treatment in each event must go on in the presence of the constant function of respiration with its incidence of motion in spine, lungs and thorax. In the case of the spine, and I believe the lung also, it is desirable to limit the immobilizing influence to as small an area as possible and allow the free motion and function of the remaining portion of the spine or lung.

This has a far-reaching influence upon metabolism and the general well-being of the patient. This is particularly apropos in the case of pulmonary tuberculosis. The human organism cannot exist without sufficient respiratory function, and, therefore, in this instance, it is doubly important to immobilize, if possible, only the diseased area of the lung, and thus allow the maximum amount of uninvolved lung to carry out to the utmost this very necessary function of life, namely, respiration.

With continuity of bone go blood-vessels. The urge to repair, associated with any destructive lesion, results in the demand for the development of increased circulation. In the

Read before Arizona State Medical Association, Phoenix, April 17-19, 1941.

various discussions on the mechanism of healing following collapse therapy, no mention has been made of the desirability of making way for the establishment of an increased collateral blood-supply to the diseased area of the lung.

There is a very striking parallel in this respect with the healing of spinal and pulmonary tuberculosis. In either case, the establishment of increased blood-supply to the involved area is one of the important elements in permanent healing. In the case of the tuberculosis spine, the bone-graft does this to a superb degree. In the case of pulmonary tuberculosis, it is my belief that well executed and directed thoracoplasty results in a similar way. That is, if, following the most careful study and roentgenological survey of the thorax and its contents, the ribs overlying the tuberculous area are removed sub-periosteally and in such a way that they will be regenerated in a markedly depressed position, thus permanently exerting pressure upon the desired circumscribed area of the lung, then undoubtedly, adhensions between the closely contacted thoracic wall and the diseased portion of the lung will develop. With the physiological urge of repair of the necessity of additional blood-supply to the pulmonary lesion, collateral circulation will result. In this case, the query should be made —whether the adhesions in this instance will not have a beneficial influence rather than the contrary; and, from this standpoint, it is apparent that the analogy in the respective discussions is quite similar, although the anatomical regions are quite different.

Referring to the old saying that a patient with tuberculosis has no time to lose, it is unwise in this dread disease to try temporizing, palliative measures, particularly since it is impossible to prognose the benignity or virulence of an individual case in advance; and again, since tuberculosis is such a chronic disease, one can never foretell, or deny the possibility of some intercurrent mishap such as a cold, pneumonia, trauma or some other acute disease which may entirely upset the best calculations.

In spinal tuberculosis, failure to secure bony ankylosis, eventual relapse is almost the rule rather than the exception. In pulmonary as in bone work, a clear understanding of the physical condition existing must be obtained by means of a careful physical, as well as x-ray examination, before the thoracoplasty is done. The structures producing the collapse should be accurately placed over the cavitation and no unnecessary interference with the function of normal lung tissue should be made, which is so pointedly the case in the other types of surgical immobilization, particularly artificial pneumothorax which compresses the whole lung including even additional lobes, irrespective of involvement or its lack. Another handicap in pneumothorax is its lack of permanency and the never-ending variability as to the amount of collapse or immobilization it may produce at any particular time.

Plombage for the same reason does not appeal because it is a foreign body and because it physically intercepts any possibility of blood-supply developing from the thoracic wall to the pulmonary tissue in the area of its application. There is always present the possible catastrophe of the foreign body sloughing into the cavitation.

Another striking analogy between the conservative treatment of spinal tuberculosis as compared with pulmonary is seen in the use of the plaster jacket. The involvement of the spinal column may be limited to two vertebrae and still the plaster jacket must include the whole trunk, thorax and abdomen combined, both of which are very essential to maintaining the best general condition of the patient in order that he may combat this dread chronic disease. In spite of this extensive conservative splintage interfering to such a degree with bodily functions, respiration and gastro-intestinal functions, a vicious circle is permitted in that the more the disease disintegrates and collapses the involved vertebral bodies, the greater the amount of motion that is mechanically allowed at that particular point and, by the same token, the more the motion, the greater the disintegration.

There is another analogy that is outstanding between the surgical work necessary in the case of spinal tuberculosis and pulmonary tuberculosis and that is that in both instances, the treatments formerly were conservative and non-operative, and, therefore, it necessarily followed that men who were expert and efficient in carrying out conservative treatments, have, in many instances, failed to bring the technical skill necessary to this most difficult surgi-

cal problem. This has delayed and handicapped and still is handicapping, the advancement of this type of therapy, both in joint and thoracic regions and this has resulted, I believe, particularly in the case of pulmonary tuberculosis in the easier but not so desirable treatments being often unwisely selected as initial steps, namely, artifical pneumothorax, plombage, phrenicectomy, exercises, etc. I do not wish for a moment to claim that these types of therapy do not have their place, but unfortunately, so frequently does the unexpected happen and the case becomes a virulent one, precisely as I have observed for over thirty-five years in the case of tuberculosis of the spine. Real tragedies have developed because some surgeon chose to select palliative treatment and when the case came to me months or years later, there may have been an enormous hunch-back deformity, paralysis due to the disease extending to the spinal meninges or cord, extensive psoas abscesses, etc. In those cases, if the most effective permanent treatment, bone-graft fusion, had been applied, the story would have been entirely different.

The choice of methods to attain permanent cure lies between non-operative measures and extra-articular arthrodesis (fusion). The same principle applies to the same degree in pulmonary tuberculosis. The acceptance by the profession of this principle of bringing about permanent immobilization by bone-graft surgery of the joints has been relatively rapid from the beginning and very gratifying to me. I was the first to publish my results in the case of the spine in 1911, and have continued to employ the same type of procedure since as the sole treatment for severe joint tuberculosis.

Non-operative or conservative measures in the treatment of joint tuberculosis, include the application of casts and braces and the use of the frame and the block. The plaster cast which includes the whole trunk must be judged according to the general principles of splinting. Since both thorax and abdomen normally change their dimensions constantly, the cast cannot be fitted closely enough to maintain immobility and thus the cardinal principle of splinting must be sacrificed. It cannot be expected that any form of external splinting will immobilize a series of short bones of irregular contour to which are attached muscles acting in coordination with the muscle of respiration and the voluntary muscles which move the head and limbs. In addition to the imperfect attempts at immobilization thus made, the cast seriously restricts the movements of the thorax and abdomen and interferes with the oxidation and nutrition on which so much depends in the treatment of any form of tuberculosis. By the same token, if there is an apical focus of the lung, the cast tends to aggravate it by constricting the lower lobes and leaving the upper relatively free, thus throwing the work on the diseased portions of the lungs.

Conservative methods of treatment may therefore be described as the application of measures of doubtful efficacy under circumstances more or less inimical to the general health of the patient.

My first attempts in 1908 were directed toward fusion of the spinous processes with fragments of bone obtained locally. I was not satisfied with the ultimate results, and the more I examined the principles on which the operation was based, the more faulty did they seem. The spinous processes supplied an insufficient amount of bone to anchor the vertebrae securely. Of greater fundamental importance was the consideration of the low osteogenic power of vertebral bone. It is a common surgical observation that fractures of the vertebral processes unite slowly, if at all; the progressive lysis of the vertebrae in Kummel's disease suggests that the bodies have little recuperative osteogenic power, and the progression of tuberculosis in the vertebral body is apparently not hindered by any adequate reparative process of osteogenic nature.

These suspicions concerning the low osteogenic potentialities of vertebral bone were confirmed by experiments in 1908 and 1909, when I transplanted cubes of vertebral bone and ulnar bone from dogs into their own erector muscles. The latter showed marked superiority in osteogenesis.

The obvious solution of the difficulty seemed to be the application of a strong single graft from a long bone to make up for a local deficiency of bone of low osteogenic power, and also because of its adequate length to influence immediate immobilization of the affected vertebrae. I chose autogenous bone for reasons which seemed then, and I am convinced still are, in

accord with the soundest biological principles.

My hope was that this graft of living bone would not only provide immediate mechanical support and added osteogenic power to promote ankylosis, but also act as a vessel-conducting scaffold from each spinous process to the next and from the unaffected ones to those whose circulation is impaired from the influence of tuberculosis. It seems sound reasoning to attribute the unusual success of the method, in part at least, to the linking up of the cancellous circulation in each affected vertebrae with that of its neighbor, and, through the graft, with that of the healthy vertebrae adjoining the affected area. At least it is difficult to account for the phenomenal results on the basis of immobilization alone, although it is realized that complete immobilization cannot be effected in any other way.

SURGICAL CONSIDERATIONS

My practice is to operate on any patient at any age, provided the surgical risk is good. The surgical risk depends on several factors:—

1. *The General Condition of the Patient:* The question of shock in relation to different operations for tuberculosis of the spine has already been discussed. If the surgeon is skillful and rapid, he may consider the bone-graft operation if the patient is fit for any major operation.

Paraplegia, perivertebral or psoas abscess, or pulmonary disease may provide an additional indication for the operation.

High temperature due to a secondary pyogenic infection is a contraindication to operation. The bacteremia must be allowed sufficient time to subside; a transfusion of blood may help. Pyrexia due solely to the tuberculosis is not a contraindication to operation.

2. *Multiple Lesions:* The presence of tuberculous foci elsewhere has often to be taken into consideration in determining operability. I have frequently observed, especially when the focus was in the kidney, testicle, epididymis or lung that the spinal operation went on to a successful issue, although the general resistance of the patient was insufficient to prevent the second focus either to the point of destruction of the affected organ or to the necessity for its extirpation. I have observed the same favorable result after operations on monarticular joints in the face of progressive tuberculosis elsewhere. The presence of a second tuberculous focus, therefore, even if it is progressive, does not contraindicate the operation.

3. *Age of the Patient:* The bone-graft operation has been more readily accepted by the profession in adults than in children. It has been held that, since the bones in a child are smaller and not fully developed, the operation should be postponed. My position is that immediate advantage should be taken of the safety of the operation to afford the child an aid to ankylosis. Supportive medical treatment should then be carried out just as if the operation had not been performed.

In a case of acute progressive disease in the child, one often observes excessive hinge motion at the center of the kyphosis, accompanying respiratory movements. This indicates that the underlying vertebral bodies have disintegrated and the respiratory thrust has been transmitted to this area left without immobilizing support. A vicious circle is set up; the greater the mobility, the more rapid the destruction; and destruction increases mobility. The vertebral bodies melt away still more progressively.

There is no room for argument in such cases. It is clear that the process must be checked as soon as possible. It is equally clear that frames, braces or temporizing methods cannot be expected to answer such demands.

No disease varies in virulence and in response to expectant treatment to the degree that tuberculosis does, wherever it is found. It is unfortunately impossible in the incipient stages to say whether the course will be mild and favorable or progressive, destructive and fatal; whether conservative methods will be effective, and if so, how long they will be required. I have always felt the profoundest regret, in operating late upon unfortunate protracted cases, that the operation had not been undertaken long before and the patient spared years of invalidism.

As long as the prognosis remains as untrustworthy as it is, there is only one attitude to adopt toward a given case and that is to consider that it is more likely than not to be unfavorable for conservative treatment, and, therefore, to operate in every case. To be sure, a certain number of cases respond to any kind of treatment, and it is this small percentage which has encouraged some surgeons to cling

tenaciously to conservative methods in all cases and to prolong them even in the face of clear evidence that the case demands more radical treatment. The following statement, in reference to pulmonary disease made by Dr. E. J. O'Brien [3] might well be made truthfully about tuberculous joint disease, particularly in the case of the spine. He states: "It is frequently inferred that the management of pulmonary tuberculosis should be less mechanical than is suggested. There are still those who would fiddle while Rome burns — with idle discussions of acute benign, benign hematogenous and other elusive phases of the disease which might not require collapse therapy, but sad and humiliating as it may be, with our present knowledge, if we wish to eliminate tuberculosis, we must be mechanics."

"It is difficult to maintain a position of conservatism which does not by watchful waiting carry us past the optimum moment for interference."

".....if expectant treatment after a reasonable period of time fails, a surgical and medical conference should determine the type of procedure which will give the individual patient his best chance of recovery."

This intrusion by the surgeon into the tuberculosis field, formerly a strict medical domain in which any surgical intervention was frowned upon, has meant the rehabilitation of a large number of patients with advanced tuberculosis, otherwise doomed to a chronic invalidism, and has been the means of converting many an otherwise hopeless consumptive into a hopeful, fighting tuberculous individual. This statement is just as true in reference to the operative versus the conservative treatment in the bone and joint realm. Lest any one foster the notion that there is great confliet between the medical and surgical treatment of pulmonary tuberculosis and waste valuable time attempting to find out which is the more valuable, let me state here specifically that there should be no such confliet between the phthisiologist and the surgeon in the treatment of this disease. Each method has its place and very frequently it is only by a combination of the two that the desired end-results can be obtained. Neither medicine nor surgical operations alone cure tuberculosis unaided. The medical regime of prolonged intensive rest, hygienic living, good food, actinotherapy, symptomatic control, etc., properly applied, favors healing by assisting the patient to build up his bodily resistance against the disease and by reducing to a minimum any trauma or other influence which might help spread the process.

Probably no disease offers a more fruitful field for cooperative medical effort than does tuberculosis (osseous or pulmonary) with its complications. Coordinated work between the internist, roetgenologist, phthisiologist and an experienced and competent surgeon is not only desirable, but should be almost mandatory.

Many bizarre and radical procedures, such as complete excision of a knee or hip or an entire lobe of a lung for early or late lesions have been attempted in the past. The patient with osseous or pulmonary tuberculosos has no chances to throw away. He should not be deprived of any means which may contribute even slightly to his chance of recovery.

Antero-posterior and posterior-anterior roentgenographic studies of the chest do not always give all the information about the thorax that it is possible to obtain. In cases in which additional information is desired, various elaborate x-ray studies of the thorax showing condition of lung both before and after operation is most important as it is in bone and joint work.

SUPERIORITY OF COMPLETE SURGERY

The diseased lung is reduced in volume locally and immobilized similar to that brought about by the fusion of tuberculous knee or spine. The statement that thoracoplasty may also be substituted for pneumothorax in those patients who are gradually losing their pneumothorax due to an adhesive pleuritis with or without repeated fluid formation, or in the migrating consumptive, where it is impossible or very inconvenient to receive satisfactory pneumothorax treatment sufficiently close to the patient's home, sounds very much like the advice given to surgically fuse a joint case by bone-graft long after conservative braceage has failed. This is particularly true in spine cases as evidenced by the x-ray showing an increased number of involved vertebrae, increased kyphosis, mediastinal abscess and even paraplegia. In the joint case, if life is saved, permanent crippling may result.

The underlying fundamental principle is to give immobilization to the tuberculous tissue

wherever the involvement may be, particularly when this tissue is normally in a state of constant motion. In the course of twenty-four hours, the thorax which includes the spine contracts and expands approximately 25,000 times.

Collapse of a circumscribed area of the lung may be obtained by interposing a substance between the pleura and the costal wall. To accomplish this, various material and devices, living and inert, have been utilized such as fat, muscle tissue, paraffin and rubber sponges and bags. Foreign bodies are always a source of danger. They may slough into the lung cavity, which is nothing less than tragedy. In all events, they interfere with the normal blood-supply and further inhibit development of increased circulation to diseased areas which is always desirable in any tuberculous lesion. It should be emphasized that thoracoplasty in this respect excells all other operative procedures. It permanently holds in contact the thoracic wall with the diseased portion of the lung in state of collapse. In a similar way that the bone-graft does in osseous disease, it promotes ways and means for scaffolding and thus the development of a collateral circulation to the diseased area.

For the same reason, I wish to register disagreement with the following: —

"No patient is selected for thoracoplasty, of course, until an attempt has been made to control the disease with phrenicectomy, pneumothorax or the combination of both."

The same statement might be paraphrased in reference to joint involvement as follows:— "No patient should be surgically fused until a failure has been determined by conservative splintage and much valued time lost."

As I have said before, the patient with tuberculosis has no chances to throw away and until the profession becomes more proficient in prognosis, the most effective and permanent treatment possible should immediately be carried out.

The following statement by McCrossin [5] is so well taken: "The amount of rib resected and the number of ribs taken at any single sitting should be determined by x-ray condition of the patient, type and extent of lung lesions, the rigidity of flexibility of the pleura and underlying tissues and the amount of collapse necessary to control the pathologic condition present, rather than by any preconceived idea of removing a certain number of ribs. Extrapleural thoracoplasty is not arbitrarily a one, two or three-stage operation, but a remodeling of the chest wall to control underlying pathology and must be varied to meet individual needs and conditions."

In order that the remodelled thoracic wall shall hold permanently the conformation necessary to keep up a constant collapse, pressure of the underlying diseased portion of the lung,— it is necessary that the ribs be removed subperiosteally with as many placques of bone clinging to the periosteum as possible left behind from which the new markedly depressed rib will develop. Proper splintage during the whole period of formation of this depressed rib is imperative.

It is believed that the bone and joint clinic can be considered as the most satisfactory research laboratory to study these tuberculous therapeutic problems; in that bone is very satisfactory to study by x-ray and further, that motion can be completely removed from a whole joint in a way that is impossible in pulmonary disease. Ankylosis by surgery of a tuberculous joint is curative not only because it produces immobilization, but because it induces an increased blood-supply to the diseased anaemic area. It is believed that this is very analogous to that which takes place following a well executed thoracoplasty.

Cutler [5] states:—"When adequate collapse has been obtained in properly selected cases, the results have been almost miraculous. . . . . "

The same can be said of the influence of ankylosis by surgery of a tubercular joint. Evidence of this is that satisfactory collapse frequently results in resorption of exudative infiltrations (Pinner)[6]. "A survey of the clinics as a whole, reveals appalling fact that 85% of patients with cavities die within five years if treated by conservative methods alone."

"That young cavities are more amenable to mechanical treatment, particularly to the simpler methods of compression therapy is explained by the fact that sufficient time for the development of fibrotic, rigid walls has not elapsed. Obviously then, the recognition of the presence of a cavity in its early stages, followed by prompt permanent surgical collapse of this portion of the lung is most important.

It is now felt that no longer should artificial pneumothorax be necessarily considered as the first method of treatment in every case of cavitation. Statistics have shown that in only about one-third of the cases in which artificial pneumothorax is attempted can its administration be successfully carried out. One disadvantage lies in the fact that it must be maintained over a long period of time, which makes it practically an impossible procedure for the poor and middle-class individual, due to the absence of pulmonary tuberculosis clinics throughout the country offering artificial pneumothorax to patients of this class.

CONCLUSION:

In reviewing at this date the outstanding relative features of the treatment of pulmonary and osseous tuberculous disease, one must be struck with the unfortunate probability that in both instances these cases are likely to remain too long under the care of men not highly trained in the very difficult technic necessary to properly handle such very serious cases.

The treatment of the incipient case in both fields may be started by practitioners, not skilled surgeons. This status, however, is fortunately fast going out in both fields. At least in the hands of the inexperienced or incompetent surgeon, procrastination is sure to follow, if not very serious delay in applying the intricate surgical methods necessary. And, again, so many times when surgery is finally brought to bear upon the case, it is carried out by a clumsy, poorly trained surgeon. In both of these fields the most exacting surgery is necessary.

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Recent Developments in the Treatment of Urinary Infections*

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IN order to appreciate what a rapid advance the last ten years have seen in urinary antisepsis, it is only necessary to realize that until 1895, when Nicolaier introduced methenamine, the treatment of urinary infections consisted in alkalization when the urine was acid and acidification when it was alkaline. Until the introduction of the ketogenic diet, in 1931, in the treatment of urinary infections, methenamine was the most useful urinary antiseptic. Its effectiveness was dependent on the splitting off of formaldehyde in an acid urine. Many failures with this drug were undoubtedly due to the lack of a sufficiently acid urine. A definite drawback to the successful use of the drug was the narrow zone between the range in which it acted therapeutically and the range in which it acted as an irritant on the mucosa of the bladder, producing pain and hematuria. It is, however, still of definite use and, when the more recently introduced urinary antiseptics fail, it deserves a trial. It should be used as indicated in table 1.

TABLE 1

Directions For The Use Of Methenamine

1. Render urine acid with ammonium chloride 0.5 to 1.0 gm. four times a day.
2. After twenty-four hours, test pH of urine (nitrazene paper).
3. If pH is 5.5 or less, give 0.3 to 0.5 gm. methenamine every six hours.
4. After forty-eight hours culture urine.
5. If the urine is not sterile, increase each dose by 0.15 gm. every fourth day up to tolerance, as shown by frequency and hematuria.
6. Culture urine for sterility four days after discontinuing administration of drug.

The ketogenic diet was a great step forward, in demonstrating that the body could produce a concentration of an organic acid in the urine sufficient to act bacteriocidally at a range between pH 5 and 5.5. Beta-oxybutyric acid, as shown by Fuller, is the antiseptic agent. It is destroyed normally in the body when given by mouth, and only when the patient is in a state of ketosis will it appear in the urine in high concentrations. Beta-oxybutyric acid in a concentration of 0.5 per cent is bactericidal at a pH of less than 5.5. The ketogenic diet was rather difficult to take and expensive to pre-

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pare, so that when Rosenheim introduced mandelic acid in place of beta-oxybutyric acid, another great step forward was made. Mandelic acid is best taken in the form of calcium mandelate. In concentrations of from 0.5 to 1.0 per cent, mandelic acid acts bactericidally in the urine, at a pH between 5 and 5.5. With both organic acids it is the undissociated free acid that produces the bactericidal effect.

The outline given in table 2 is helpful in using the drug.

TABLE 2

Directions For The Use Of Mandelic Acid

A. Conditions necessary for bactericidal action:
   1. A half to 1 per cent mandelic acid in urine.
   2. pH of 5.5 or less (nitrazene paper).
B. Dose: One gram ammonium or calcium mandelate in twenty-four hours for each 100 c. c. of urinary output.
C. Procedure:
   1. Keep urine sterile for four to six days.
   2. Culture urine for sterility four days after discontinuing administration of drug.

The disadvantages of mandelic acid as a urinary antiseptic are the large amounts that have to be taken, the likelihood of upsetting the patient's stomach and the occasional production of hematuria. These are minor, in that they do not interfere with the action of the drug. Its major drawback is the inability of the damaged kidney to excrete a urine with the necessary concentrations of the organic acid or a sufficiently low pH or both. Its other failure is in the group of infections producing a strongly alkaline reaction in which the urine cannot be acidified.

With the introduction of the sulfonamide compounds, urinary antisepsis made another great step forward. It was found that in concentrations that could be reached easily in the urine, sulfanilamide proved bactericidal for all the bacteria found in urinary infections with the single exception of Streptococcus faecalis. This drug has the additional advantage that it is excreted by the damaged kidney in bactericidal concentrations and is as effective in an alkaline as in an acid urine.

Unfortunately, its use has shown us how commonly Streptococcus faecalis is a secondary invader to the various gram-negative bacilli in urinary infections. By getting rid of the bacillary elements, sulfanilamide frequently leaves behind a pure infection of Streptococcus faecalis.

Except for this handicap, sulfanilamide is an excellent urinary antiseptic of proved value when those antiseptics requiring an acid urine have failed.

The outline given in table 3 is helpful in using the drug.

TABLE 3

Directions For The Use Of Sulfanilamide

A. Conditions necessary for bactericidal action:
   1. Concentration of 50 mg. of free sulfanilamide per 100 c. c. of urine.
   2. Action more effective in alkaline urine.
B. Dose:
   1. Infants: 0.15 to 0.2 gm. four times a day.
   2. Older children: 0.3 to 0.6 gm. four times a day.
C. Procedure:
   1. Keep urine sterile for four to six days.
   2. Culture urine for sterility four days after discontinuing administration of drug.

With the introduction of the newer sulfonamide compounds many of them were tested for their superior qualities as urinary antiseptics. Sulfapyridine was found to share the weakness of sulfanilamide in its lack of action on Streptococcus faecalis, and its tendency to be precipitated in the pelvis, ureters and bladder has shown it to be of less value than sulfanilamide.

Of the newer compounds introduced, sulfathiazole has proved very useful as a urinary antiseptic for a number of reasons, most important of which is its action on Streptococcus faecalis. Not dependent on the reaction of the urine in its effect on any of the gram-negative bacilli and Staphylococcus aureus, it is found to act bactericidally on Streptococcus faecalis at concentrations of less than 30 mg. per 100 c. c. of urine only in a urine that has a pH of 5.5 or less. At concentrations of 200 mg. per 100 c. c. it acts bactericidally in all studies set up at a pH of 6.5. At a pH of 5.0 a concentration of only 10 mg. per 100 c. c. has a decided bactericidal effect.

Sulfathiazole is excreted rapidly in the urine and only a small proportion is acetylated. However, it does tend to form a crystalline deposit in the collecting tubules, pelvis, ureters and bladder, if given in large amounts in the absence of a sufficient amount of fluid intake to wash it through the kidneys. Hematuria is the danger signal. Complete anuria may occur and has caused death on a number of occasions. Doses such as required for the treatment of urinary infections even with strongly resistant bacteria are not likely to give rise to calculi. From 30 to 45 grains (2 to 3 gm.) is usually sufficient, when given in five divided doses in twenty-four hours. Many infections will not require nearly this amount. One grain (0.065 gm.) a day will give a concentration of from 3 to 4 mg. per 100 c. c. of urine with an output of from 800

to 1,000 c. c. a day. The outline given in table 4 is helpful for the use of sulfathiazole as a urinary antiseptic.

TABLE 4

Directions for the use of sulfathiazole

A. Conditions necessary for bactericidal action:
   1. Concentration of 150 mg. per 100 c.c. of urine.
   2. Only Streptococcus faecalis seems to require acid urine.
B. Dosage:
   1. Infants up to two years 0.75 to 1.5 gm. (grains XII to XXIV) in five divided doses during twenty-four hours.
   2. Older children 1.0 to 2.5 gm. (grains XV to XL) in five divided doses during twenty-four hours.
C. Procedure.
   1. Keep urine sterile for four to six days.
   2. Culture urine for sterility not less than four days after stopping administration of drug.

The use of sulfathiazole is particularly helpful in the treatment of patients who have badly damaged kidneys. In such a case even as small a dose as 1 grain (0.065 gm.) a day in the presence of marked diuresis, 3,000 to 3,600 c. c. a day, was sufficient to change a urine that was full of pus and contained innumerable bacteria per 0.5 c. c. in culture, to one that was crystal clear and contained only from 100 to 800 bacteria per 0.5 c. c., when plated on agar (table 5).

It seemed of value to determine whether sulfanilamide or sulfathiazole was the more effective urinary antiseptic in concentrations in which they could be excreted by the damaged kidney. It is this group of patients that respond poorly to the antiseptics requiring an acid urine. I therefore studied the bactericidal effect of urine containing sulfanilamide and sulfathiazole in concentrations of 30 mg. and 10 mg. per 100 c. c. of urine. At both concentrations sulfathiazole was definitely superior to sulfanilamide. Figure 1 indicates the comparison at a concentration of 10 mg. per 100 c. c.

TABLE 5

The striking effect of small doses of sulfathiazole in controlling the pyuria associated with high blood urea

Boy, 16 years of age. Left clinic 2-24-41. Taking 0.06 gm. twice daily. Urine clear until administration of drug was stopped 3-21 because of a convulsion.

Date, 1941	Blood urea, mg. per 100 c.c.	Urine: Pus, grade*	Urine: Bacteria, per 0.5 c.c.	Urine: Sulfathiazole, mg. per 100 c.c.	Dosage: Gm.	Dosage: Total daily, grains	Remarks
3-24	222	4	Innumerable		0.012 x 5	1	Pseudomonas infection
3-27		4	200	1.0	0.012 x 3	⅝	No medication from 10 p.m. 3-26 to 4 p.m. 3-27
3-28	222	2	400	1.0	0.012 x 5	1	Urine cloudy
3-29		1	550	1.0	0.012 x 5	1	Urine crystal clear

*On the basis of 1 to 4, in which 1 indicates the least and 4 the greatest amount of pus.

When it was seen that Escherichia coli was killed off in 95 per cent of the observations at a concentration of 10 mg. per 100 c. c. of urine, observations were carried out with greater dilutions until no further bactericidal effect was evident. Down to a concentration of 1.25 mg. per 100 c. c. a bactericidal effect was noted in 90 per cent of observations carried out with twenty-one strains of colon bacilli. At a concentration of 0.1 mg. per 100 c. c. a single strain was reduced in numbers and another strain retarded in its growth. When we consider that 1 grain (0.065 gm.) a day will give a concentration of from 1.5 to 2.0 mg. per 100 c. c. of urine, and a concentration of 1.25 mg. per

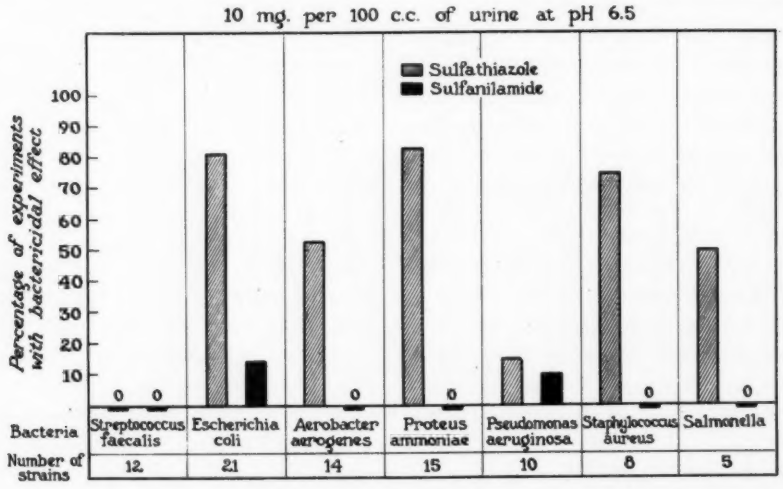

Fig. 1. Bactericidal effect of sulfanilamide and sulfathiazole in urine. (From Helmholz and Larson: A comparison of the bactericidal effect of low concentration of sulfanilamide and sulfathiazole on bacteria from urinary infections. J. Urol. 46: 322-331 (Aug.) 1941.

100 c. c. is bactericidal in 90 per cent of observations with Escherichia coli, then it is evident that this drug should prove of great value not only in the treatment of urinary infections, but in the prevention of postoperative infections resulting from catheterization. If it is given in a dose of 0.125 gm. (2 grains) five times a day by mouth, a concentration of between 25 and 40 mg. per 100 c. c. of urine should result. This concentration is ample to inhibit the growth of practically all the bacteria found in urinary infections, except Streptococcus faecalis, so that it is reasonable to expect that urinary infections developing during a period in which sulfathiazole is being given prophylactically, will be limited to Streptococcus faecalis infections. The rest of the infections will be prevented. More recent observations indicate that if the urine has an acidity of pH 5.5, Streptococcus faecalis also will be killed off.

SUMMARY

The therapeutic use of methenamine, mandelic acid, sulfanilamide and sulfathiazole in urinary infections is given in outline form. These four drugs can all be used successfully in urinary infections in treatment of patients who have normal kidney function. In treatment of patients who have damaged kidneys and are infected with a urea-splitting species of bacteria, sulfanilamide and sulfathiazole are the drugs of choice.

Sulfathiazole is superior to sulfanilamide as a urinary antiseptic, because of its action on Streptococcus faecalis and its bactericidal action in lower concentrations on the various other bacteria found in urinary infections.

The Mayo Clinic

Flocculation Tests for Syphilis

(Plant Sap Reactions)

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II ROOTS

IN an earlier paper[1] the serology of various plant saps was discussed. In these investigations the reaction of the tops of the plant only was discussed, however, no roots of any of the plants were used as a source of sap. Since the roots of a plant are the absorption organ and the tops the synthesis organs, it seemed possible that there might be a difference in the saps from the various portions of the plant.

EXPERIMENTAL

Seedlings were grown in sand culture for a period of three-four weeks, then carefully dug up and the sand thoroughly washed from around the roots. The tops and roots were clipped from the seeds and the saps extracted by use of a Carver hydraulic press under a pressure of 10,000 per square inch. The saps so obtained were then centrifugated at a speed of 4,000 R. P. M. for ten minutes and the clear supernatant fluid aspirated off. Kline, Mazzini, Hinton, and Leiboff tests were then run on three different portions of sap obtained from the tops and roots. The saps giving positive reactions were diluted with normal saline to determine the maximum titre where they would give positive reactions. The Veterans' Administration Wassermann was run on a series of ten plants. The results obtained are given in Table I.

TABLE I

The reaction of the saps from tops and roots of various plants.

Plants		Kline	Mazzini	Leiboff	Hinton	Wasser-	Titre
Red beans	Tops	2+	2+	2+	2+	AC	1.32
	Roots	0	0	0	0	AC	0
Cotton	Tops	3+	3+	3+	3+	2+	1-128
	Roots	0	0	0	0	Neg.	0
Corns	Tops	4+	4+	4+	4+	AC	1-128
	Roots	0	0	0	0		0
Raddish	Tops	4+	4+	4+	4+	AC	1-128
	Roots	0	0	0	0	AC	0
Turnip	Tops	4+	4+	4+	4+	AC	1-128
	Roots	0	0	0	0	AC	0
Parsnip	Tops	4+	4+	4+	4+	Not run	1-128
	Roots	0	0	0	0		0
Onion	Tops	4+	4+	4+	4+	Not run	1-128
	Roots	0	0	0	0		0
Sweet Pea	Tops	4+	4+	4+	4+	Not run	1-128
	Roots	0	0	0	0		0
Rye Grass	Tops	4+	4+	4+	4+	AC	1-128
	Roots	0	0	0	0		0
Callan-dalas	Tops	4+	4+	4+	4+	Not run	1-64
	Roots	0	0	0	0		0

Ice Plant	Tops	2+	2+	2+	2+	Not run	1-128
	Roots	0	0	0	0		0
Sour Clover	Tops	2+	2+	2+	2+	Not run	1-128
	Roots	0	0	0	0		0
Dock	Tops	4+	4+	4+	4+	Not run	1-128
	Roots	0	0	0	0		0
Johnson Grass	Tops	2+	2+	2+	2+	Not run	1-64
	Roots	0	0	0	0		0
Lypia	Tops	4+	4+	4+	4+	Not run	1-64
	Roots	0	0	0	0		0
California Poppy	Tops	4+	4+	4+	4+	Not run	1-128
	Roots	0	0	0	0		0
Mustard	Tops	4+	4+	4+	4+	Not run	1-128
	Roots	0	0	0	0		0
Milo	Tops	0	0	0	0	Not run	0
	Roots	0	0	0	0		0
Oats	Tops	0	0	0	0	Not run	0
	Roots	0	0	0	0		0
Wheat	Tops	4+	4+	4+	4+	AC	1-128
	Roots	0	0	0	0	AC	0

DISCUSSION

The variance in the reactivity of the saps from the various portions of the plants presents a very interesting observation. If comparison between animals and plants can be drawn we may say that the roots of a plant correspond to the stomach of an animal since it is the absorbtion organ. The tops of the plant correspond more or less to the various tissues of the animal body. That is, that the plant foods will be found in simpler forms in the roots of the plants. In the more highly specialized parts of the plant such as the stems and leaves we find the plant foods tied up in the more complex molecules such as the starches, sugars, and plant proteins. It would seem that the simple molecules as such are not affecting the serology, but rather that the more complex molecules are the controlling factor in the production of floccules.

A satisfactory explanation of the observed phenomenon is not available at this time. Experiments on the effect of the age of the plant and also upon plant feeding are now underway in this laboratory which it is hoped will help explain the observations.

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** Arizona State Laboratory, Tucson, Arizona.

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Iris Changes in Syphilis: Further Observations

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THE author has previously reported[1] a new physical finding which is believed to be useful in the diagnosis of syphilis. In this earlier study the results of the examination of 276 patients were reported, and at the conclusion of the investigation it was noted that a number of extremely important questions regarding these changes and the value of the iris sign as a diagnostic test had been left unanswered. Among these were the effect of age on iris changes, presence of iris changes in other diseases, the relation of positive irides to serological tests and to the stage of syphilis, and the classification of iris changes as to degree of change. Also the effect of pigmentation (color) of the iris was not accurately noted. At the same time it was felt that the series of patients was too small from which to draw definite conclusions and that it was necessary to examine a great many more patients in order to note the effect of increasing numbers examined on the accuracy of this physical finding. With these points in mind, the investigation was continued until 1769 patients had been examined and classified. Of these 1201 were examined by the author and 558 by other investigators.

The changes noted consist of (1) *an appearance of pitting in the outer segment of the iris,* (2) *a deepening of the inner segment, and* (3) *an eccentricity of the circulus iridis minor.*

So far as could be determined from examination of the available literature, no mention of this change in the iris in syphilis has ever been made.

ANATOMY OF THE ANTERIOR SURFACE OF THE IRIS

The anterior surface of the iris is separated into two segments, an inner or pupillary segment and an outer or ciliary segment, by an irregular circle, the circulus iridis minor (collarette, inner circle, etc.), which lies concentric with the pupillary margin of the iris. The pupillary segment is heavily striated by radial lines, and is somewhat depressed in relation to the ciliary segment. The ciliary segment extends from the circulus iridis minor to the ciliary margin of the iris. It is smooth except for an occasional radial stration or fold, and, in some irides, by occasional circular folds or "contraction rings"

which extend only one-fifth to one-third the circumference of the iris. Immediately on the outside of the circulus iridis minor may be seen occasional ovoid depressions which are known as the crypts of the iris. They are supposed to allow passage of fluid in and out of the stroma of the iris during its almost constant change in volume. Occasionally they are seen in the ciliary segment near the ciliary margin.

Dark and light colored irides differ in that in the former pigment is abundant in the stroma and on the anterior surface. In the latter it is less abundant, and so it is that the trabecular structure of the blue or grey iris is more plainly visible. The crossing of these trabeculae form rhomboid depressions which may be mistaken for crypts of the iris.

The circulus iridis minor is normally concentric with the pupillary margin of the iris.

In a section through the pupil, the iris is seen to be composed of four layers:[2]

(1) The anterior mesoblastic layer which extends from the periphery to the circulus iridis minor, where it ends.

(2) The posterior mesoblastic layer extends from the periphery to the pupillary margin. The portion of this layer which is visible in the living eye forms the pupillary segment of the iris. Between this layer and the termination of the superficial mesoblastic layer there may be seen an angle, the Angle of Fuchs. This angle forms the circulus iridis minor.

(3) The stroma of the iris is a loose fibrous tissue containing nerves, blood vessels, and the radial and circular muscles of the iris.

(4) The posterior layer is known as the retinal layer and is heavily pigmented. It turns forward over the pupillary margin of the iris and so is visible as a narrow, serrated black ring surrounding the pupil.

APPEARANCE OF THE IRIS IN SYPHILIS

The irides of many syphilitic patients present several deviations from the normal:

(1) There are small ovoid depressions in the superficial mesoblastic layer which are similar to the crypts in appearance, but which are not confined to the borders of the ciliary zone but are seen also in its central portion. They are more numerous than is usual.

(2) The circulus iridis minor is in many cases not concentric with the pupillary margin of the iris, but is eccentric. It has the appearance of having been pulled to one side, away from the pupil.

(3) The Angle of Fuchs between the superficial and deep mesoblastic layers is increased, and the pupillary segment appears, in consequence, to be set on a plane posterior to that of the ciliary zone.

These changes are not all visible in every eye which is considered indicative of syphilis in appearance, although occasionally all three changes may be noticed. In this series, diagnosis was made from the presence of one or more of the changes described above. The typical appearance is easily learned, but is very difficult to describe. Examination of a score of normal and syphilitic irides has sufficed to teach the appearance of the syphilitic iris to beginners.

Some irides cannot be classed as either "normal" or "syphilitic" and have been called "doubtful." These made up about 2% of the present series.

EXAMINATION OF PATIENTS

Examination of patients is carried out by instructing the patient to look the examiner in the eye and by projecting the light from a small pocket flash lamp across the anterior surface of the iris from temporal to nasal sides. This procedure throws depressions into shadow and illuminates raised areas. A distance of eight to twelve inches is optimum. The author uses a Welch-Allen tongue-depressor light because of the variations in intensity possible with the rheostat. Magnification is a hindrance rather than a help in routine examination, and a darkroom is unnecessary. Examination, after the investigator becomes familiar with the anatomy of the iris, requires only a glance in most cases.

The subjects examined in this series were divided into three groups:

(1) Subjects known to have syphilis.

(2) Subjects known not to have syphilis.

(3) Subjects about which nothing was known but whose serological reactions were checked after examination of the iris.

RESULTS:

Group A—Positive Controls:

1. Acquired Syphilitics.

This group consists of 222 patients from the Dallas Venereal Clinic. All have syphilis and

all are being treated. Almost all are adults, and the majority are negroes.

Positive	Irides—180	or 81.1%	(Sensitivity)
Negative	Irides— 29	or 13.1%	Error 18.9%
Doubtful	Irides— 13	or 5.8%	

2. Congenital Syphilitics.

Patients from Freeman Memorial Clinic. This group consists of 60 children with congenital syphilis. All are undergoing treatment.

Positive	Irides— 20	or 33.3%
Negative	Irides— 36	or 60.0%
Doubtful	Irides— 4	or 6.7%

In this group (A), Lemoine's veil[3] was found present in 8 or 13.3%, absent in 50 or 83.3%, and doubtful in 2 or 3.3%.

Group B—Normal Controls.

1. Adult Normals.

This group is composed of 85 doctors, medical students, nurses, and technicians. None had syphilis.

Positive	Irides— 7	or 8.2%	
Negative	Irides— 76	or 89.4%	(Specificity)
Doubtful	Irides— 2	or 2.4%	

2. Child Normals.

This group consists of 386 boys ranging in age from 12 to 18 years.

Positive	Irides— 17	or 4.4%
Negative	Irides—369	or 95.6%

Group C—Unknown Patients.

1. Unknown Hospital Patients.

This group consists of 193 patients from the wards of Parkland Hospital in Dallas, Texas. Their serological reactions were unknown at the time of examination, and were checked and recorded after the iris was examined.

False Positives	— 22	or 11.4%	
False Negatives	—10	or 5.2%	
Doubtfuls	— 5	or 2.6%	
Gross Error	— 32	or 16.6%	Error 19.2%
Gross Accuracy	—156	or 80.8%	

2. Unknown Insane Patients.

This group was composed of 255 patients of the Austin State Hospital for the Insane at Austin, Texas. They were chosen as unknown controls who have no physical illness which might impair the accuracy of the sign.

False Positives	— 9	or 3.5%	
False Negatives	— 19	or 7.4%	
Doubtfuls	— 7	or 2.8%	
Gross Error	— 28	or 10.9%	Error 13.7%
Gross Accuracy	—220	or 86.3%	

Group D—Entire Series.

This group consists of the entire 1201 patients which have been examined to date.

Total number patients examined	—1201	or 100.0%	
Total number doubtfuls	— 31	or 2.6%	
Total number errors	— 149	or 12.4%	Error 15.0%
Total number correct	—1021	or 85.0%	

DISCUSSION OF RESULTS

Throughout the investigation it has been necessary to decide on the basis of history, physical examination, and serologic results whether or not a patient had syphilis. As there is a certain percentage of error in the serologic tests used, so there must be a certain error in the results obtained here. However, every attempt has been made to so place the error as to work against rather than for the accuracy of the iris sign. In other words, the figures here reported are an expression of the minimum probable accuracy of the finding rather than of the maximum probable accuracy.

Variation of results with increasing numbers of patients examined has been noted with interest:

Number Patients	Accuracy	Error
276	83.4%	16.6%
418	83.2%	16.8%
500	82.4%	17.6%
946	85.7%	14.3%
1201	85.0%	15.0%

SPECIAL STUDIES

1. Effect of Age on Iris Changes. It was thought that possibly age and vascular changes might be a contributory cause of the iris changes. To determine the presence of any such effect, data on 444 ward patients previously examined at Parkland Hospital were checked according to age with the following results:

Age	Number	False Positives	False Negatives	Accuracy	Error
1-40 yrs.	360	5.5%	8.3%	86.2%	13.8%
40-80 yrs.	84	5.1%	8.3%	86.6%	13.4%

This apparently indicates that the sign is as accurate in patients over forty years of age as in those under forty.

2. Presence in Other Diseases. It has been noted that several subjects who had strongly positive irides and no sign of syphilis had been afflicted with certain other diseases. Malaria and pneumonia were the most frequent in histories of these subjects. It was later discovered, however, that although many of the 386 boys examined in East Texas claimed to have had malaria, remarkably few had positive irides. Consequently no definite conclusion has been drawn from this study.

3. Relation to Serological Tests. In order that a more closely controlled group of subjects might be reviewed, a special group of 100 patients was studied. These patients are included in the group of acquired syphilitics (A). Results of the Kline, Kahn, and Wasserman tests were available on these patients, all of whom had syphilis and were being treated. The results are tabulated below:

Reaction	Kline	Kahn	Wasserman	Iris
Negative	19%	22%	26%	9%
Doubtful	10%	14%	0%	6%
Positive	71%	64%	74%	85%

Although this series seems to show the iris

test to be the most sensitive and specific of any, it must be remembered that all of these patients had received specific treatment for syphilis. The Wasserman test seemed to be the most accurate in this group, the Kline next, and the Kahn least accurate in treated patients.

4. Relation to stage of Syphilis. Iris findings in various stages of syphilis in 100 patients are given below:

Stage	No. Patients	% of Total	Positive Irides	Negative Irides	Doubtful Irides
Primary	7	7	7	0	0
Secondary	23	23	22	1	0
Latent	63	63	49	8	6
Tertiary	4	4	4	0	0
Congenital	3	3	3	0	0

It is difficult to draw conclusions from such a small group. Of course, the attempt was made to determine how early the iris changes appear. Although further investigation along this line has not been done, it is the author's impression that cases in the primary stage do not show iris changes as frequently as do cases in later stages of the disease. Strangely enough, a number of patients with central nervous system syphilis showed more false negatives than is usual.

5. Classification of Iris Changes. In this series an attempt was made to classify iris changes as absent, slight, severe, etc. The customary one, two, three, and four plus was used. One hundred syphilitics were examined for this purpose.

Reaction	Number	Per cent
Negative	9	9
Doubtful	6	6
One plus	14	14
Two plus	8	8
Three plus	21	21
Four plus	42	42

It was found that the three and four plus irides, or marked changes, were seen in 63%. The findings of 14% one plus reactions and only 8% of two plus reactions seems to indicate the presence of a statistical error, or that the figures do not represent any actual condition. Most important was the conclusion that there was no relation between the stage of syphilis or the amount of treatment and the degree of iris change.

6. Relation of Accuracy to Color of Iris. It has been the impression of the author and of those associated with him in this work that because of the difficulty of noting iris changes in non-pigmented blue or grey eyes, there should be a decrease in the accuracy in patients with light-colored irides. To determine the truth of this assumption, a computation was made upon patients already examined. It was felt that it would be more accurate to separate the groups into white patients (many of whom have blue or grey irides) and colored patients (almost all of whom have dark irides) and to compare the accuracy of the iris test in this way rather than to run a small series based upon the color of the iris alone.

The patients used were: (1) All the unknown insane patients (Group C, 2), 143 of whom were white and 112 colored, and (2) a group of the positive controls (Group A, 1) of whom 43 were white and 60 colored. The results are as follows:

	No.	Doubtful	False Positives	False Negatives	Acc.	% Accuracy
White Patients	186	4	3	13	166	89.2%
Colored Patients	172	9	5	14	144	83.7%

These figures seem to show that the race of the patient, and hence the color of the iris, has little effect upon the accuracy of the iris test, and that the accuracy in patients with non-pigmented irides is slightly greater than in those with pigmented irides.

There is no doubt that one must examine poorly pigmented irides more thoroughly, nor that the characteristic changes are somewhat different in the two types of irides; but with careful examination, either group will yield similar results. It is unfortunate that the color of the iris was not noted in all the patients examined, but this will be done in future investigations.

INTERPRETATION OF SPECIAL STUDIES

In the routine diagnosis of syphilis, the object is to have a test or group of tests which will give at least a hint of the presence of the disease. It is seen that in the group of positive syphilitics, the Kline test would have made the diagnosis in 71%, the Kahn in 64%, the Wasserman in 74%, and the Iris Test in 85%. It was found that eighteen patients had no serological test positive; thus the use of the Kline, Kahn and Wasserman together would have made the diagnosis in 82% of the cases. How-

(Continued on page 296)

Erratum.—The following error occurred in the article entitled "Some Pulmonary Problems Related to Anesthesia," which appeared in the June issue of this journal: In the eighth line of the first paragraph of the article the word *possible* was used instead of *impossible.*

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ONE CLEAR CALL

Much concern has been expressed regarding the response of a portion of the medical profession to the need for physicians in the armed services. Many of the younger doctors have refused to accept duty with the army or navy, adopting varied reasoning and excuses for their actions. Prominent among the statements made by some is that "I would go in a minute if we were in war." Of course, if enough go now and assist in demonstrating to the jackals of the world that Uncle Sam has a good strong right arm ready and tough, we may have no war. If war can be prevented in this manner from touching America, surely those men who serve now in the grand program of preparedness and training are even more entitled to the designation "hero" than those who jump in when the fire has started. It is easy to give service to one's country when the cannon roars and personal fears and emotions are aroused. It is more difficult to arrive at decisions involving such intangibles as loyalty, patriotism, self-abnegation and personal sacrifice when no bombs are falling into one's own backyard. Yet, of such intangibles were the tough, fine men of a former day in America made. Such qualities are expected of physicians, of all men. If they be not present in that body of citizens, surely the splendid ideals of service we have long advocated must then have been mere mouthings of egotists.

Deplorable is the descent of the physician into the market-place, setting a price on his services and haggling over dollars and goods like a common fish-wife. Some of our brothers cry for their palms to be crossed with silver for their services in examining draftees. Others tell of how much more money they can make at home in comparison to their salary as an officer in the service of their country. By these short comings the medical men of America are now being judged by their fellows—make no mistake about that! If there be one who doubts that, or who is serenely confident of his halo, let him but put his ear to the ground and listen, like he never has before in his life. Let him put away the nostalgic wishes for the good old yesterdays, and listen and heed. Let him answer the call of need of his land. Let him in so doing repay a part of the debt he owes that land for his education, his heritage of freedom, his very life.

Disturbingly frequent of late have been such appraisals as that of Colonel John H. Schaeffer, Medical Corps, U. S. Army, speaking before the California Medical Association:

For some peculiar reason the older members of the profession seem anxious to serve regardless of rank or financial consideration . . . Many of these older men uncomplainingly and apparently cheerfully give up long-established and lucrative practices and accept active duty at an actual financial loss . . .

The attitude of the younger members of the profession is in sad contrast to that of their elders. Large numbers of those holding commissions in the Medical Reserve resign or otherwise attempt to evade service when called and it appears that those who apply for such commissions do so chiefly to avoid being inducted under the Selective Service Act. This is an alarming situation which, if not rectified, will absolutely nullify all other efforts of the profession in connection with National Defense.

It is a challenge to the profession which must be firmly and courageously met and not avoided by high sounding platitudes.

This whole problem is a personal one. It must be solved personally and individually, by the taking of one's decision in the privacy of one's own conscience. America needs thousands of its young doctors now. America has given its young doctors everything they possess. Can her sons remain heedless in the face of her need for their help today? Can a dollar mean more to these fine young men than selfless devotion to a splendid ideal? Have they the courage to comprehend and respond to a high duty? Every man who reads this must examine himself honestly, objectively, deciding if what is said here applies to him. Then he must respond, yes or no, and by his response be forever marked.

Your America needs you, doctor, and awaits your considered answer. Is it to be a dutiful yes, or a denying no? The time has come to stand and be counted. The decision cannot be put off longer. The realities of your country's need must be faced—and no one can decide for you, save you yourself.

And, finally a prayer. For the love of and in the name of this ancient and grand profession of ours, let it never be said that its present-day devotees crucified it in the hour of decision upon a cross of silver!

SINUSITIS

To the otolaryngologist the extent of misinformation concerning the sinuses in disease and health is sometimes astonishing, if not disheartening. Such misinformation is not completely confined to the laity. Too often other physicians are heard to say, with utter sincerity, that "one sinus operation leads to another", or "I've never seen a sinus cured". It is perhaps the fault of the otolaryngologist that he has not undertaken a more comprehensive course of education of both his colleagues and the laity regarding this phase of the practice of medicine.

Some, surgical nihilists, have attempted to treat all cases of sinal disease with drugs and with physiotherapy. Others see a surgical problem in most diseased sinuses. It is the duty of the otolaryngologist today to so equip himself with basic knowledge and judgment that he may thereby be enabled to chart a middle course between the two above suggested. And, in so doing, he will serve the cause of his sometimes maligned specialty; but more important, he will better preserve the health of his patients.

Disease of the tissues of the sinuses is not greatly different from disease of soft tissue anywhere else in the body. There is inflamation; the production of swelling, of pus; there may be fibrosis and consequent thickening; there may be impairment and even destruction of function; there may be putrefaction and necrosis. Much the same type of organisms gain inroad into sinus tissue as elsewhere. Differing in location when diseased. One would not expect abdominal cramps from an acute maxillary sinusitis, yet headache would certainly be not unexpected. But, the swallowing of copious quantities of sinal discharge might lead to such symptoms as anorexia, nausea and vomiting.

All is not gold that glitters; likewise, all is not sinusitis that appears so. Paradoxically more sinusitis is diagnosed than exists. The impression is rather wide-spread that to diagnose sinusitis is an easy task. Yet, to properly evaluate and assess the relative importance of sinus-like symptoms may tax heavily the best knowledge and diagnostic acumen that one possesses. Upon correct diagnosis will depend the treatment and outcome of each case. There are certain very definite steps in the diagnosis of sinus disease, and to do the job at hand correctly, these steps must be followed. This routine is well-known to the modern otolaryngologist.

Correct treatment is dependent on the correct diagnosis of the type of sinusitis present. Necessarily, treatment must be fitted to the individual case. The aim of all methods is, in the final analysis, to aerate, drain and restore the tissues to normal. Some of the procedures available in the treatment of sinusitis are:

1. Medical
   - A. Shrinking solutions used as sprays, drops, irrigations, displacement, packs.
   - B. Lavage with iodized oils, normal saline solution, shrinking solutions, antiseptic solutions.
   - C. Use of autogenous and stock vaccines, based upon the type of organism present.
   - D. Foreign protein therapy.
   - E. Use of anodynes as indicated.

G. Allergic study and treatment, using various tests and methods of desensitization.

2. Surgical
   A. Basic
      (a) Submucous resection (b) removal of nasal polyps (c) correction of all malformations in the air chambers of the nose (d) removal of infected adenoid or tonsil tissue (e) dental care of infected teeth (f) correction of irreversibly diseased or hypertrophied turbinates.
   B. Direct
      (a) Nasoantral openings, with cristectomy (b) complete operations such as the Caldwell-Luc procedure for the antra, the Killian type of frontal surgery, the trans-antra-lethmoid procedure in pansinusitis, exenteration of the ethmoid cells via the intra-nasal route. These operations aim to denude the infected sinuses of all membrane present.
   C. Physical
      (a) X-rays and radium coupled with surgery, in neoplasms (b) shortwave diathermy.

As elsewhere in the body, if the proper regime of treatment is adopted in caring for the different types of pathology present in the sinuses, good results may be anticipated. Likewise, failure to cure and discredit upon the specialty of otolaryngology may be brought about by choosing the wrong type of treatment in the given case. This point is to be stressed, for therein lies the reason for many of the failures in the treatment of sinus disease.

Sinusitis is a wide-spread affliction, of greatly varying severity. Because it may be a crippling or even fatal disease its study and treatment must be based on sound, basic knowledge and comprehension. This knowledge should embrace a thorough understanding of the anatomy, pathology and physiology of the tissues concerned. Significant additions to research concerning the behavior of the sinus tissues in health and in disease have been made in recent years. Diagnosis and treatment of sinusitis, if done in the light of this latter-day information, holds out to those afflicted quite as much hopes for a cure as can be connected with diseases of tissues anywhere else in the body. The physician owes it to his patients to inform himself of the hope and promises inherent in present-day otolaryngology.

IRIS CHANGES IN SYPHILIS: FURTHER OBSERVATIONS

(Continued from page 293)

ever, the fact that of these 100 patients there was only one patient who showed all three serologic tests and the iris test to be negative leads us to the conclusion that the necessary hint could have been found in 99% of the patients examined by using all four tests. This, in the opinion of the author, is the most important single observation here presented.

OTHER INVESTIGATORS

In an attemt to evaluate the importance of the personal equation in elicitation of the iris sign, the author taught several friends of varying degrees of enthusiasm and crudulity to examine the iris for the changes herein described. Their results are tabulated below:

1. Dr. W. E. Long of the Dallas Venereal Clinic examined 300 patients, all of whom had syphilis. He found that 80% of these had positive irides.

2. Dr. John Hinchey, at Robert B. Green Memorial Hospital in San Antonio, Texas, brought the following interesting information:

143 syphilitic patients were examined.

123 or 86% had positive irides.

Of these 123 patients, 93 or 75.6% had crypts, eccentricity of the circulus iridis minor, and depression of the inner segment.

18 or 14.6% had crypts and eccentricity but no depression of the inner segment.

3. Dr. Earl L. Malone, working at the Texas State Tuberculosis Sanatorium at Sanatorium, Texas, examined 125 tuberculous patients, 14 of which had syphilis and 111 of which did not have the disease. His results were as follows:

Number of patients	125	
False Positives	10	
False Negatives	5	
Doubtfuls	8	
Accuracy	102	or 81.6%
Error	23	or 18.4%

Of the 14 patients with syphilis, only 9 or 64.3% showed positive irides, but only 10 or 9.0% of the 111 non-syphilitic patients had positive irides.

The accuracy of the test in the hands of four different investigators working separately in different places is as follows:

Investigator	No. Cases	Accuracy
Lowry	1201	85%
Long	300	80%
Hinchey	143	86%
Malone	125	81.6%
Total	1769	83.2%

CAUSE OF IRIS CHANGE

The cause of the iris change is at present purely speculative. The author has been unable to secure the iris from a patient known during life to have both syphilis and a positive iris. Irides from cadavers have been examined grossly and those apparently showing the characteristic changes have been sectioned. The information derived from these sections has been meager, due partially, at least, to the poor staining qualities of these preserved tissues. However, the impression has been gained that there is an increase in the cellular elements of the iris and that this increase is due particularly to relatively large numbers of plasma cells which were seen in those irides whose anterior surface showed the characteristic configuration. This increase in plasma cells was not seen in the sections of normal irides. Further investigation of this aspect of the problem is necessary in order to determine the pathogenesis of the iridial changes.

It is possible that the change is the result of a subclinical inflammation which occurs during the primary spirochetemia of syphilis and which is followed by perivascular infiltration and scarring. Upon contraction of the scar tissue, the circulus iridis minor might be distorted and the anterior surface of the iris drawn into the stroma in localized areas, thus forming the characteristic "pits". These have been seen in many cases to be present coincident with a primary lesion, but the iris changes are far less common as a rule during the primary stage and reach a maximum of occurrence during the early secondary stage. It has not been possible to find a patient with negative irides and serology and follow him through the stages of acquired syphilis.

SUMMARY AND CONCLUSIONS

A physical finding is presented. It has been found present in a large percentage of patients with syphilis and absent in a large percentage of normal people. It is by no means pathognomonic of syphilis, but should serve to arouse suspicion of the disease when present and of the accuracy of positive serological reports when absent.

It seems to be unassociated with age or with other diseases.

It has been found in all stages and types of syphilis.

The percentage accuracy of the finding has remained relatively constant during the examination of 1,201 patients.

Results obtained by investigators other than the author show only minor changes in percentage incidence .

The sign is easily elicited and requires no special equipment and little special training.

Used as an adjunct to the serological tests for syphilis, the percentage of correct diagnoses has been increased in this series of cases.

Used alone, the iris sign has frequently served to arouse suspicion of syphilis. This is probably the most important use of the sign..

412 10th Street

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COMMUNICATIONS

Sir:

The demand for qualified persons to fill medical positions in the Government grows faster than the supply. The Commission is now announcing examinations to secure qualified persons for three types of medical positions—Junior Medical Officer, Medical Guard-Attendant, and Medical Technical Assistant.

The Commission hopes to secure wide publicity on these examinations and the inclusion of a notice in your publication would be highly valuable in advising qualified persons of the Government's National Defense needs.

The examination for Junior Medical Officer will be open until November 15, 1941 and the examination for Medical Guard-Attendant and Medical Technical Assistant, until further public notice. If you cannot publicize the examinations in the issue of your publication now in preparation, it is hoped that you may find it possible to include it in a future issue.

By direction of the Commission:

Very respectfully,
WILLIAM C. HULL
Executive Assistant

NEWS

General

The forty-sixth annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held at the Palmer House, Chicago, October 19-23, under the presidency of Dr. Frank R. Spencer, Boulder, Colo.

The academy's program consists of one general scientific meeting on the morning of the first day, separate programs for the two specialties on alternate afternoons and instructional courses every morning beginning on Tuesday.

The feature of this year's general opening meeting will be a symposium on vertigo, with Dr. Francis H. Adler, Philadelphia, representing ophthalmology; Dr. William J. McNally, Montreal, otolaryngology, and Dr. Bernard Alpers, Philadelphia, neurology.

During the convention there will be various meetings of small groups, including the "Teachers' Section," secretaries of local eye, ear, nose and throat societies and alumni organizations. The meeting of the teachers' section will be concerned especially with the role of the Academy in national defense during the present emergency. There will also be a scientific exhibit that will include such subjects as "Ocular Conditions in Children Due to Systemic Disease," "Conduction of Sound in the Ear," "Hemophilia and Other Blood Dyscrasias as Manifest in the Eye, Ear, Nose and Throat," "Cancer of the Larnyx" and "Significance of the Eyegrounds in the Problem of Hypertension."

Alternating with the scientific programs of the specialties each afternoon will be an elaborate motion picture program. Thus when the section of ophthalmology is meeting for formal presentation of papers, motion pictures on otolaryngology will be available for those interested in that field.

Dr. Perry Goldsmith, professor of otolaryngology of Toronto Faculty of Medicine, Toronto, Ont., will be the academy's guest of honor this year.

This years' International Assembly of the Inter-State Postgraduate Medical Association of North America will be held in the public auditorium, Minneapolis, Minnesota, October 13, 14, 15, 16 and 17.

A full program of scientific and clincal sessions will take place each day and evening of the Assembly, starting at 8:00 o'clock in the morning.

In cooperation with the Hennepin County Medical Society, the Minnesota State Medical Association and the Minneapolis Civic and Commerce Association, a most excellent opportunity for an intensive week of postgraduate medical instruction is offered by in the neighborhood of eighty-five distinguished teachers and clinicians from different parts of the United States and Canada who are honoring the Assembly by contributing to the program. The speakers and subjects have been carefully selected by the program committee.

Pre-assembly and post-assembly clinics will be conducted, free of charge, in the Minneapolis Hospitals on the Saturdays previous to, and following the Assembly, for visiting members of the profession.

Excellent scientific and commercial exhibits of great interest to the medical profession will be an important part of the Assembly. These exhibits will be open to members of the medical profession in good standing without paying the registration fee.

The registration fee for the scientific and clinical sessions will be $5.00.

The list of distinguish teachers and clinicians who are to take part on the program appears on page 303 of the advertising section of this Journal.

The Sixth Harlow Brooks Memorial Navajo Conference was held August 25, 26 and 27, 1941 at Sage Memorial Hospital, Ganado, Arizona.

The following program was given under the direction of Dr. C. G. Salsbury:

Boyd, E. Forrest; Los Angeles
"Why Laugh?"

Greer, Joseph Madison, Commander M. C. U. S. Naval Reserve on active duty
"Surgery in the United States Navy"

Raney, R. B.; Los Angeles
"Technical Advances Having a Favorable Influence on Morbidity and Mortality from Intracranial Surgery" (demonstrated by a colored motion picture)

Rigg, James P.; Grand Junction, Colo.
"Upper Respiratory Foreign Bodies"

Ball, Franklin I.; Los Angeles
"Mucous Membrane Lesions" (including 16mm colored movie) (of interest also to dentists)

Palmer, E. Payne; Phoenix, Arizona
"Recent Advances in Carcinoma"

Anderson, Forrest N.; Los Angeles
"Some Mental Hygene Viewpoints on Children's Problems" (a "short paper")

Rees, Clarence E.; San Diego, Calif.
"Modified Technique for Amputation of the Lower Third of the Femur (Slides and short movie)

Gallant, A. E.; Los Angeles
"Some Observations from Orthopedic Examinations of Men Under the Selective Service Act"

Bishop, L. F., Jr.; New York
"Harlow Brooks" (picture and film to Illustrate it)

Bishop, L. F., Jr.; New York
"The Senile Heart"

Hutchinson, Wm. W.; Los Angeles
"Cyclopropane—A Safe and Efficient Anesthetic"

Jackson, Chevalier L.; Philadelphia
"Cancer of the Esophagus"

Powell, Tracy O.; Los Angeles
"Urological Problems in Children"—and colored motion pictures

Stewart, Steele F.; Los Angeles
"Tenosynovitis"

Sprague, Buell H.; Los Angeles
"Hypoglycemia"

Peter, W. W.; Window Rock, Arizona
"The Wetzel Grid"

Daniel, William H.; Los Angeles
"Benign and Malignant Tumors of the Lower Colon" (demonstrated by lantern slides and perhaps short motion picture)

Davison, Roland; Tucson, Arizona
"Neuropathic Changes Associated with Spinal Arthritis"

Jones, Newell; Los Angeles
"The Problem of Nutritional and Other Developments in Childhood"

McMaster, Paul E.; Los Angeles
"The Recognition and Treatment of Bone Tumors"

Peter, W. W.; Window Rock, Arizona
Movie on Tuberculosis Among the Navajos

Smith, R. Nichol; Los Angeles
"Peritoneoscopy"

El Paso

Dr. Louis W. Breck announces the association of Dr. W. Compere Basom in the practice of Orthopaedic Surgery at El Paso, Texas. Dr. Basom has recently completed a fellowship at the Mayo Clinic.

The Staff Meeting of the Hotel Dieu Sisters' Hospital, was held August 5, 1941 at 12:10 o'clock in the auditorium of the Nurses' Home.

The program:

Chronic nephritis. Perforation of small intestine.....Dr. Russell Holt
Discussion.....Dr. J. L. Green

The regular monthly staff meeting and dinner of the Southwestern General Hospital was held Thursday, July 31, 1941 at 6:30 p. m. in the hospital auditorium.

The program:

Multiple Internal Injuries Following Accident
Dr. W. J. Pangman
Dr. A. Treece

MISCELLANY

CHIROQUACKERY

Is chiropractic an innocent, harmless, therapeutic procedure? Do chiropractors hurt only the pocketbook without harming the system? Well, here are a few headlines taken from medical journals which may easily disprove their harmlessness:

"Chiropractic Adjustments for Diphtheria—Child Dies"; "Patient Dies in Chiropractor's Office—Coroner's Report"; "Deaths from Diphtheria in Family of Chiropractor"; "Witness Claims Chiropractor Broke Her Leg"; "Chiropractor Dislocates Patients Hip"; "Chiropractor Indicted on Charge of Manslaughter"; "Coroner's Verdict—Chiropractor Breaks Patient's Neck"; "Chiropractor Gets Thirty Years—The Patient Dies"; Fracture of Vertebrae by Chiropractor"; "Chiropractic: Death of Patient from Cerebral Hemorrhage Following Treatment"; "Malpractice: Death Resulting from Chiropractic Treatment for Headache".

We agree with Bognoll that it is foolish for a community to maintain an elaborate machinery

to prevent the spread of certain communicable diseases, and yet permit individuals to practice who are unable to differentiate diphtheria from pneumonia, scarlet fever from measles, or, in fact, to make any definite diagnosis. The matter is made worse by the fact that chiropractors advertise themselves as, and are known as, doctors and a large proprotion of the population, unaware of the connotations of the letters M.D. and D.C., assume that a doctor is a doctor, and that all are equally trained in the art of healing. This is even more true when a state licenses chiropractors, for the average layman is then apt to assume the state vouches for their competency.

Let us put the matter in another way. In the practice of medicine today diagnosis, not therapeutics, is of primary importance. This is so for the very practical reason that before any physician can decide what to do for an illness, he must know what that illness is. On this account, therefore, all practitioners of the healing art, no matter what types of treatment they choose to employ, must be equally well tutored and well trained in the knowledge of the human body and the diseases to which it is subject.

Chiropractic treatment used indiscriminately is liable to be expensive and wasteful, but other considerations are much more important. It is established beyond doubt that in some disease conditions cures may be effected through the prompt employment of appropriate remedial measures: early surgical intervention for cancer and acute appendicitis, antitoxin for diphtheria, quinine for malaria, salvarsan for syphilis, etc. Delay in the diagnosis of these conditions and in the employment of the proper remedy may result in a more serious illness than might otherwise be the case, or may even result in death. —*Med. Record.*

PSYCHIATRIC CONFESSION

We have been guilty, I think, of helping man to be suspicious of his own motives, for how can one be courageous and then be dubbed a mere exhibitionist? How can one be meticulously honest and then be told that it is merely overcompensation for some hidden vice? How can one ever give expression to any decency of thought, word, or deed when it is translated into terms of indecency? Such a philosophical concept of regarding man analytically rather than considering him as a functioning organism with some pretty high motives sometimes and capable of some pretty lofty reaches in his thinking, is a brittle, cynical philosophy.

America needs no doctrine of cynicism now; it needs a credo. As a people we need a belief in ourselves, not only as citizens of this country but as human beings with potentialities for strength and purposeful achievement far beyond anything we have yet known. Within our powers we must help in preaching that doctrine. As Archibald MacLeish said recently, the writers of this generation have led young America into ways of cynicism as an outgrowth of their own disillusionment. We in psychiatry have done our part, too, for in the bewilderment of our own discoveries in the study of the mind of man, we have played a part in fostering the belief in man's inherently carnal, brutish nature. This is a belief that never offered hope or encouragement to anyone anywhere; it is a doctrine of despair. For that tired intellectualism let us preach a dynamic doctrine of man's dignity.—*Conn. St. Med. Jo.*

CLIMACTERIC CHANGES

Among the most common and intractable psychological problems with which the gynecologist must deal are the involutional depressions or the beginning melancholia at the climacteric period.

In general, these conditions are found in a rather characteristic type of woman. Usually, these women have been somewhat indulged or pampered, have loved the idea of being loved, have found narcissistic satisfaction in being wanted, and have basked in the affection bestowed upon them rather than in the fact that they gave in love. This is true in general but not necessarily so in every case. When such women approach the menopause, they resent the physical changes in their appearance, feel they are not loved or wanted, develop ideas that their husbands are unfaithful because they are no longer as attractive as formerly, or develop ideas of unworthiness and self-accusation.

In many such cases, removal from the home and placement in a sanitarium becomes a necessity. A new environment with new associations and different interests can be utilized. Theelin, particularly in larger doses, has been found to be of great value. The families of such patients should be advised to be more tolerant, patient

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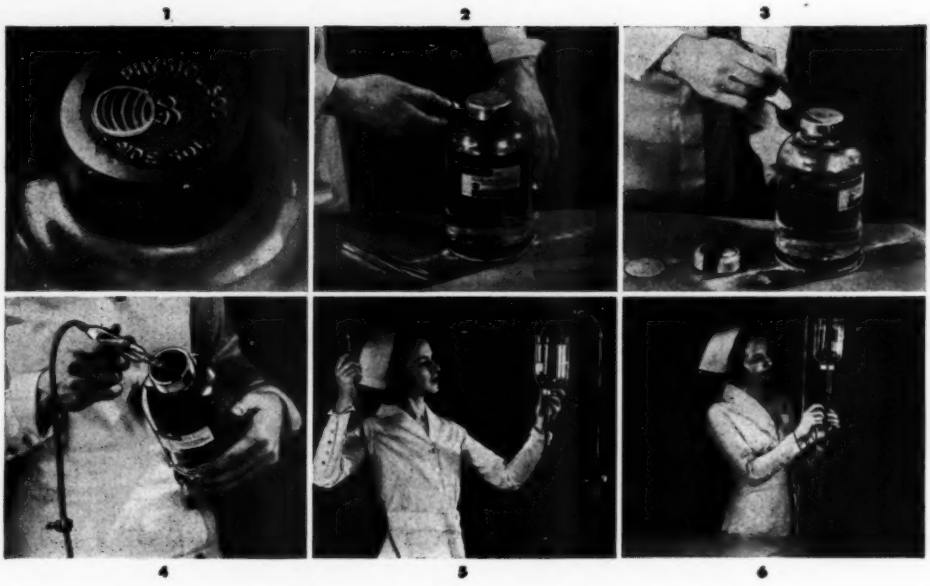

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and encouraging, and every effort should be made to safeguard the patient's ego. A feeling of "belonging," of making a contribution to family life, is an important psychological device in improving the mental attitude of such patients. This is a psychological epoch in the life history of a woman and should be dealt with sympathetically by her family and in a patient, understanding by the physician.—*Jo. M. S. M. S.*

TRICHINOSIS

One-sixth of the population of Washington, D. C., carries the trichinosis parasite a four-year study by the Zoology Division of the United States Public Health Service has disclosed.

Presence of the trichinosis organism in the body does not mean, however, that a person actually has the disease, the U. S. Public Health Service emphasized.

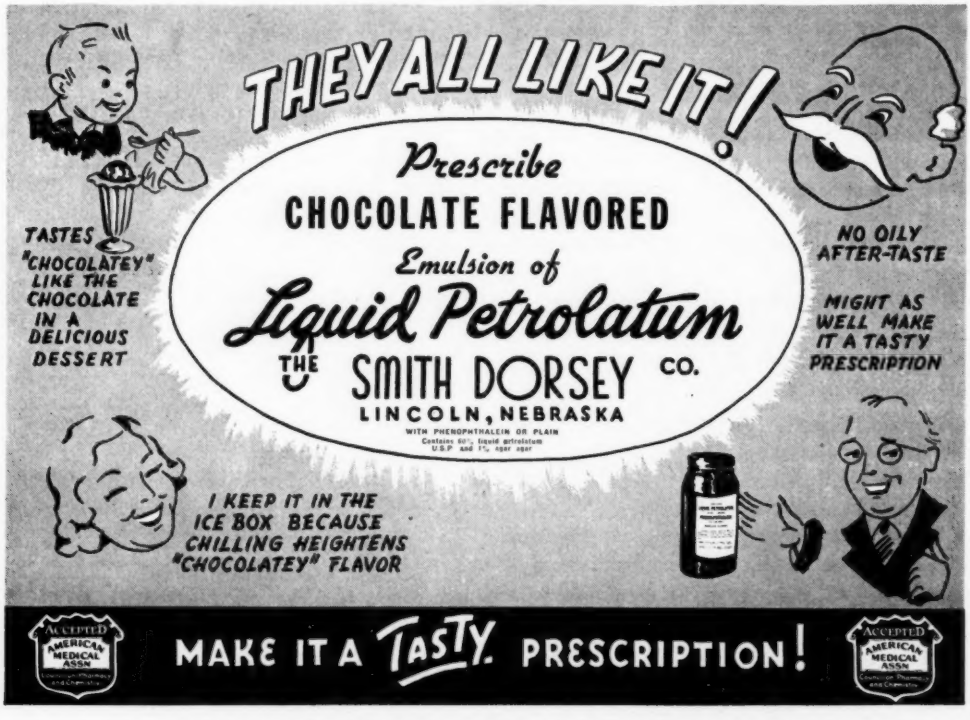
Disclosure of the unexpectedly high incidence of the parasite followed examination of 3,000 specimens of postmortem material provided by 10 Washington hospitals, 4 U. S. Naval hospitals and 2 U. S. Marine hospitals in eastern seaboard cities.

Of the 2,330 specimens obtained from Washington hospitals, 362 or 15.5 per cent, were infested with trichinae, the organism causing trichinosis. The remaining 670 specimens, which came from service hospitals in other cities, were 18.8 per cent infested.

Washington was selected as the chief source of material because of the cosmopolitan nature of its population. Gallinger, George Washington, Garfield, Georgetown, Mt. Alto, U. S. Naval, Walter Reed, Freedmen's, St. Elizabeths and Children's hospitals cooperated.

The percentage of individuals carrying the trichinosis organism in the 3,000 specimens is believed to indicate the extent of infestation to be found in similar population groups in other parts of the United States. Trichinosis infestation is believed to be less in rural areas and a survey of these areas is now being made by the Zoology Division of the National Institute of Health.

Despite popular opinion, Public Health Service zoologists believe the practice of feeding raw cabbage to hogs is more to blame for trichi-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I KEEP IT IN THE ICE BOX BECAUSE CHILLING HEIGHTENS "CHOCOLATEY" FLAVOR
ACCEPTED AMERICAN MEDICAL ASSN
MAKE IT A TASTY PRESCRIPTION!
ACCEPTED AMERICAN MEDICAL ASSN

nosis in humans than eating improperly cooked pork.

It is believed that if all hogs were corn-fed, the disease could be much more scientifically controlled than in placing full reliance on thorough cooking of pork for human consumption.—*Jo. M. A. of Ga.*

EXAMINATIONS FOR MEDICAL POSITIONS ANNOUNCED BY CIVIL SERVICE COMMISSION

Examinations for three types of medical positions in the Government service have just been announced by the Civil Service Commission. This is another indication of the great demand for technically trained personnel of every kind in the defense program. Each of these positions has been open to competition within the past year, but the demand grows even faster than the supply.

Junior medical officer positions at $2,000 a year will be filled at St. Elizabeths Hospital in Washington, D. C. There are two types of interneship: Rotating and Psychiatric Resident. The rotating interneship consists of 4 months of surgery, acute medical service, and of chronic medical service; 2 months of obstetrics and of pediatrics, on affiliation; 3 months of general laboratory work; and 6 months of psychiatry. To qualify, applicants must be fourth-year students in a Class A medical school. Applicants must show completion of the course prior to June 30, 1942 before they may enter on duty. Graduates in medicine who have already served an accredited rotating interneship are offered a postgraduate interneship of 1 year of psychiatry (American Medical Association Classification 2, Type B). To qualify for this type of appointment, applicants must have completed their fourth year of study in a Class A medical school subsequent to December 1935 and must

INTERNATIONAL MEDICAL ASSEMBLY

INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

Public Auditorium, Minneapolis, Minnesota, October 13, 14, 15, 16, 17, 1941.

Pre-Assembly Clinics, October 11; post-assembly clinics, October 18, Minneapolis Hospitals

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ALL MEDICAL MEN AND WOMEN IN GOOD STANDING CORDIALLY INVITED

INTENSIVE CLINICAL AND DIDACTIC PROGRAM BY WORLD AUTHORITIES

The Following is the list of members of the profession who will take part on the program:

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Alfred W. Adson, Rochester, Minn.
John Alexander, Ann Arbor, Mich.
Walter C. Alvarez, Rochester, Minn.
W. Wayne Babcock, Philadelphia, Pa.
Lewellys F. Barker, Baltimore, Md.
Claude S. Beck, Cleveland, Ohio
E. T. Bell, Minneapolis, Minn.
Herrman L. Blumgart, Boston, Mass.
Peter T. Bohan, Kansas City, Mo.
William F. Braasch, Rochester, Minn.
Carl D. Camp, Ann Arbor, Mich.
James G. Carr, Chicago, Ill.
Richard B. Cattell, Boston, Mass.
Russell L. Cecil, New York, N. Y.
Frederick Christopher, Evanston, Ill.
Warren H. Cole, Chicago, Ill.
Frederick A. Coller, Ann Arbor, Mich.
C. Donald Creevy, Minneapolis, Minn.
William R. Cubbins, Chicago, Ill.
Elliott C. Cutler, Boston, Mass.
Walter E. Dandy, Baltimore, Mass.
Robert S. Dinsmore, Cleveland, Ohio
Claude F. Dixon, Rochester, Minn.
Daniel C. Elkin, Atlanta, Ga.
John F. Erdmann, New York, N. Y.
A. Carlton Ernstene, Cleveland, Ohio
Ernest H. Falconer, San Francisco, Cal.
Warfield M. Firor, Baltimore, Md.
John R. Fraser, Montreal, Canada
Henry J. Gerstenberger, Cleveland, Ohio
Harry S. Gradle, Chicago, Ill.
Evarts A. Graham, St. Louis, Mo.
Roscoe R. Graham, Toronto, Canada
Howard K. Gray, Rochester, Minn.
Robert G. Green, Minneapolis, Minn.
Russell L. Haden, Cleveland, Ohio
Emile F. Holman, San Francisco, Cal.
Verne C. Hunt, Los Angeles, Cal.
Thomas E. Jones, Cleveland, Ohio
Elliott P. Joslin, Cleveland, Ohio
Louis J. Karnosh, Cleveland, Ohio
Chester S. Keefer, Boston, Mass.
H. Dabney Kerr, Iowa City, Iowa
J. Murray Kinsman, Louisville, Ky.
Herman K. Kretschmer, Chicago, Ill.
Frank H. Lahey, Boston, Mass.
N. Logan Leven, St. Paul, Minn.
William E. Lower, Cleveland, Ohio
Charles W. Mayo, Rochester, Minn.
John L. McKelvey, Minneapolis, Minn.
John C. McKinley, Minneapolis, Minn.
Irvine McQuarrie, Minneapolis, Minn.
John J. Moorhead, New York, N. Y.
George P. Muller, Philadelphia, Pa.
Clay Ray Murray, New York, N. Y.
John H. Musser, New Orleans, La.
Horace Newhart, Minneapolis, Minn.
Emil Novak, Baltimore, Md.
Frank R. Ober, Boston, Mass.
Paul A. O'Leary, Rochester, Minn.
Eric Oldberg, Chicago, Ill.
Oliver S. Ormsby, Chicago, Ill.
Ralph Pemberton, Philadelphia, Pa.
Dallas B. Phemister, Chicago, Ill.
Isidor S. Ravdin, Philadelphia, Pa.
Hobart A. Reimann, Philadelphia, Pa.
Erwin R. Schmidt, Madison, Wis.
Elmer L. Sevringhaus, Madison, Wis.
George E. Shambaugh, Chicago, Ill.
Leroy H. Sloan, Chicago, Ill.
Thomas P. Sprunt, Baltimore, Md.
Virgil P. W. Sydenstricker, Augusta, Ga.
Willard O. Thompson, Chicago, Ill.
Maurice B. Visscher, Minneapolis, Minn.
Waltman Walters, Rochester, Minn.
Owen H. Wangensteen, Minneapolis, Minn.
Soma Weiss, Boston, Mass.
Henry M. Winans, Dallas, Texas
Wallace M. Yater, Washington, D. C.
Hugh H. Young, Baltimore, Md.

HOTEL HEADQUARTERS: Hotel Nicollet—Hotel Radisson

HOTEL RESERVATIONS: Hotel Committee: Dr. A. N. Bessesen, Jr., Chm., 829 Medical Arts Bldg., Minneapolis, Minnesota

A program will be mailed to every member of the medical profession in good standing in the United States and Canada on or about September first.

Any member of the profession in good standing who does not receive a program, please write the Managing-Director and one will be mailed.

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have either a B. M. or M. D. degree. Applications will be accepted at the Commission's Washington office until November 15, 1941, and will be rated as soon as practicable after receipt.

Medical technical assistant positions at $2,000 a year and medical guard-attendant positions at $1,620 a year will be filled in the Mental Hygiene Division of the U. S. Public Health Service. Applicants must be registered graduate nurses, or have been honorably discharged (within the 10 years immediately preceding date or receipt of application) from active service in the Medical Corps of the Army or Navy, or have had 3 years' service as guard-attendant in a Federal penal or correctional institution. In addition, for the technical assistant, applicants must show that their experience has included one year of responsible training or experience in Clinical Laboratory Technique, Pharmacy, or X-ray Laboratory Technique. Applications will be accepted until further notice. Persons who were rated eligible for these two positions in the examination which closed in February of this year need not apply for this new examination as eligibles from both examinations will be combined on the new register.

Further information and application forms may be obtained at any first- or second-class post office or from the Civil Service Commission in Washington. Qualified persons are urged to file their applications at once.

RETURN YOUR INFORMATION CARD FOR THE DIRECTORY PROMPTLY

About September 1, an information card will be sent from the headquarters office of the American Medical Association to every physician in the United States and Canada. The information secured is to be used in compiling the Seventeenth Edition of the AMERICAN MEDICAL DIRECTORY.

The directory is prepared at regular intervals in the Biographical Department of the American Medical Association. The last previous edition appeared in 1940. This volume is one of the most important contributions of the American Medical Association to the work of the medical profession in the United States; it has been especially valuable in the medical pre-

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paredness program. In it, as in no other published directory, are dependable data concerning physicians, hospitals, medical organizations and activities. The directory provides full information concerning medical colleges, specialization in the field of medical practice, memberships in special medical societies, tabulations of medical journals and medical libraries and, indeed, practically every important fact concerning the medical profession in which any one might possibly be interested.

Before filling out the information card, read the instructions carefully. Physicians are especially urged to state whether or not they are on extended active duty for the medical reserve corps of the United States Army or Navy. Fill out the card and return it promptly whether or not a change has occurred in any points on which information is requested. If a change of address occurs before March 1, 1942, report it at once. Should you fail to receive a card before the first of October, write at once to the headquarters office stating that fact and a duplicate card will be mailed.

BOOK NOTES

NEW AND NONOFFICIAL REMEDIES, 1941: Containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1941. Cloth. Price, postpaid, $1.50 Pp., 691—LXX. Chicago: American Medical Association, 1941.

New and Nonofficial Remedies is the book in which are described the medicinal preparations found by the Council on Pharmacy and Chemistry to be acceptable for the use of physicians. The book is cumulative; each year there are added the descriptions of products accepted during the foregoing year. Those taken off the market or found no longer worthy of continued acceptance are deleted. The book is at that time also revised to bring it up to date with the most recent medical thought. Until recent years the additions and deletions have about balanced. Recently, however, the bulk of the book has been increasing and this year's volume represents the largest book of the more than thirty volumes that have been issued.

This year's new additions include the new sulfanilamide derivative, sulfathiazole, as well

For the local Treatment of Acute Anterior Urethritis
(DUE TO NEISSERIA GONORRHEAE)

SILVER PICRATE* Wyeth

A complete technique of treatment and literature will be sent upon request

*Silver Picrate is a definite crystalline compound of silver and picric acid. It is available in the form of crystals and soluble trituration for the preparation of solutions, suppositories, water-soluble jelly, and powder for vaginal insufflation.

Silver Picrate, Wyeth, has a convincing record of effectiveness as a local treatment for acute anterior urethritis caused by Neisseria gonorrheae.[1] An aqueous solution (0.5 percent) of silver picrate or water-soluble jelly (0.5 percent) are employed in the treatment.

1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

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as sulfapyridine sodium; antipneumococcic rabbit serum of types I, II, III, V, VII and VIII; human convalescent measles serum and human convalescent scarlet fever serum; and staphylococcus antitoxin. The field of endocrinology is represented by the addition of chorionic gonadotropin (follutein). The addition of shark liver oil reflects the search for new sources of vitamins A and D caused by the cutting off of foreign cod liver oil. Other newly accepted preparations are ampules of camphor, digilanid and magnesium trisilicate.

The most extensive revision is represented by the rearrangement and amplification of the chapter, Serums and Vaccines. This chapter is now prefaced by a helpful index, an innovation in N. N. R. The chapter, Vitamins and Vitamin Preparations for Therapuetic and Prophylactic Use has been revised to keep it abreast of the newer developments in this field. Here, too, we find something of an innovation in the systematic use of graphic chemical formulas. It is understood that this practice will be extended to other parts of the book in future editions. Careful perusal will reveal minor revisions in many parts of the book made in the interest of greater clarity and in the effort to keep the book thoroughly up to date.

SYNOPSIS OF DISEASES OF THE HEART AND ARTERIES. George R. Herrmann, M. S., M. D., Ph. D., F. A. C. P., Professor of Medicine, University of Texas. Director of the Cardiovascular Service, John Sealy Hospital Consultant in Vascular Diseases, U. S. Marine Hospital. 468 pp. with 91 illustrations and three color plates. The C. V. Mosby Co. Second Edition. $5.00

Many a busy general practitioner, interne and medical student will delight in this amazing time-saver that is brief, thorough, well-organized and practical. Dr. Herrmann is a master at separating the wheat from the chaff as well as eminent authority in his field. He brings up to date the newer precordial leads used in electrocardiography. A chapter has been added on standards set by military authorities for the detection of cardiovascular instabilities and disease in view of the present emphasis on conscription and militarism. The book deserves unqualified recommendation.—*V. M. R.*

CLINICAL ASPECTS OF THE ELECTROCARDIOGRAM: Harold E. B. Pardee, M. D. Assistant Professor of Clinical Medicine, Cornell University Medical College; Associate Attending Physician, New York Hospital; Consulting Cardiologist, Woman's Hospital and Methodist Hospital; Attending Cardiologist, New York Polyclinic Medical School and Hospital.

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Its shockproof head may be positioned in actual contact with patient if necessary, permitting radiography at the most difficult angles.

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EL PASO, TEXAS PHOENIX, ARIZONA

New York. 434 pp. with 219 illustrations on 102 figures. Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers. Fourth Edition, Revised. $5.75.

The new, revised edition of this standard text presents in a thoroughly understandable manner the latest significant aspects of the electrocardiogram. The newer precordial leads are explained in detail, and their clinical significance is evaluated. With this information, the current literature is more easily followed. There is complete emphasis on the clinical interpretations. Unfortunately, one chapter of the reviewer's copy was marred by several pages of back-printing and was hence illegible. Aside from the aforementioned flaw, this book is of unquestionable value in the thorough understanding of the electrocardiogram.—*W. M. R.*

INFANTILE PARALYSIS: By Philip Lewin, M. D., F. A. C. S.; Associate Professor Bone and Joint Surgery, Northwestern University Medical School, Professor of Orthopedic Surgery, Cook County Graduate School of Medicine, Attending Orthopedic Surgeon, Cook County and Michael Reese Hospitals; Consulting Orthopedic Surgeon, Municipal Contagious Disease Hospital, Chicago. Pp. 372, including Appendix and Index. Illustrated. Cloth. Philadelphia. W. B. Saunders Co. 1941.

In a forward by Ludvig Hektoen the statement is made that "while there are as yet no well established specific means for the prevention or cure of poliomyelitis, the crippling effects of the dreaded disease could be greatly reduced by early diagnosis and the best use of measures to prevent crippling and to restore muscular function." The book then adheres to such a teaching policy as is calculated to acquaint the reader with the means at hand today to reduce crippling. A good deal of space is devoted to the early diagnosis of poliomyelitis and its early treatment. The Kenny treatment of the disease in its acute phase is briefly described, and its chief benefits listed as rapid relief from pain and sensitiveness, and prevention of contractures. Judging from a preliminary report of this method of treatment by the Minnesota workers, more space could have been assigned in the book to more detailed appraisal of this rather unorthodox type of therapy.

Clear, informative photographs and drawings are startegically placed in the text. Etiology, public health aspects, surgery, physiotherapy are beautifully dealt with. The book should be of high value to the general physician and pediatrician, as well as to the specialist in

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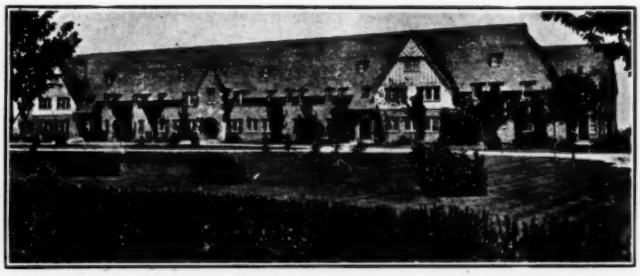
NEW TREATMENT OF DIARRHEA IN BABIES

Before the advent of Mead's Pectin-Agar in Dextri-Maltose, there were two methods of treating diarrhea in infants: (1) the "starvation" or "rest" method, consisting of withholding food during the duration of the diarrhea, offering the baby water and carbohydrate solutions. While this succeeded in preventing extreme dehydration, the child received practically no food to maintain nutrition, so that, when long continued, his resistance was greatly impaired. (2) the "Finkelstein method," based on the theory that some carbohydrates are especially likely to cause fermentation and prolong diarrhea. His method consisted of high protein feedings in the form of protein milk, sometimes with added carbohydrate, and continues to have many advocates, especially in breast-fed infants. One of the successful modifications has been

Founded 1896 by Dr. Hubert Work



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Casec (calcium caseinate), which can be used for both breast-fed and bottle-fed infants.

In recent years, the use of raw apple and weak tea for treating diarrhea has had various proponents. The literature contains reports by Birnberg, Reglien, Kaliski, Giblin and Lischner, McCaslan, Tompkins, Borovsky, Stein, and Hunt. Smith and Fried believe that any beneficial effects from scraped raw apple are due to the partial starvation effected by the regimen. The success of apple and tea therapy has stimulated hypotheses as to the effective agent. Moro attributed its value to tannic acid. Heisler would also give credit to malic acid and to the mechanical cleansing of the intestines, while Scheer places most emphasis on indigestible bulk. Malyoth believes pectin and cellulose are the active agents.

Based on their experience with apple, Winters and Tompkins devised a mixture of pectin, agar and Dextri-Maltose which was more successful. Others have privately confirmed their finding that a mixture of this nature is of value in diarrhea. Kutscher and Blumberg studied the use of pectin-agar mixture with and without carbohydrate. They concluded that the addition of Dextri-Maltose to the other constituents was a definite advantage. Various reasons for the effectiveness of both pectin and agar have been advanced but none has a background of experimental proof. It has been claimed that pectin is bactericidal, that its constituent galacturonic acid functions as a detoxifying agent, that it absorbs toxins and enmeshes bacteria, that its hydrophilic nature prevents dehydration, and that it is soothing to an inflamed gastrointestinal tract. Bulk is the only valuable characteristic advanced for the use of agar.

In practice, the application of this method differs from the starvation method in that full caloric feedings are immediately instituted and maintained.

The new method differs from protein milk therapy in that a diet high in carbohydrate is fed. It also has the advantage of palatability, particularly important with older children.

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